

# THE COMMERCIAL CAR JOURNAL

THE UNIVERSAL MOTOR TRUCK CO. is composed of expert motor truck builders and business men who have already used and expect to continue to use a large number of commercial motor vehicles.

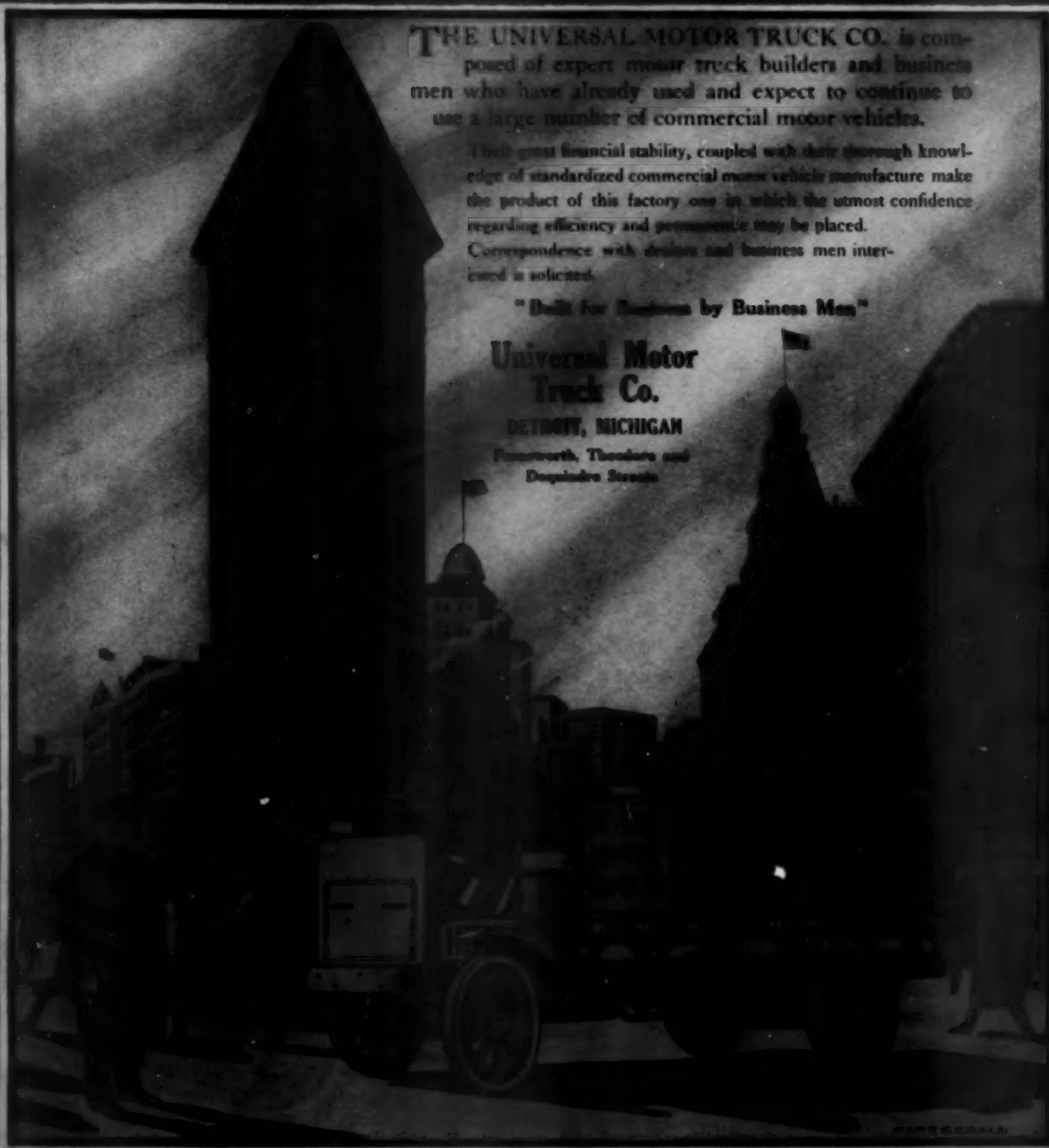
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The  
Commercial Car Journal  
will be mailed to every  
Truck Owner in the  
United States.

# THE PUBLISHERS' PERSONAL PAGE

By C. A. MUSSELMAN

## The Beginning

Although this is Volume I, Number 1, it seems to its publishers to be a Journal old enough to bear the earmarks of age. Why? Because the Commercial Car Journal is the development of good intentions of several years' standing. We have but waited for the proper period to launch this—a publication we have cherished in our dreams for a long time—and it comes not as the flash in the pan variety, but rather as a well-defined necessity to satisfy both the demand for a Journal of merit in a comparatively new field, and the ambition of the publishers, who believe there should be a strong Journal to assist in the upbuilding of the Commercial Car industry.

## Your Confidence

Among our many high ideals is to conduct the Commercial Car Journal according to those principles which establish confidence. The reading and advertising pages are not open to all comers, and the publishers will endeavor to eliminate undesirables. In this effort readers can lend assistance by giving facts about anyone whose product may find mention in our columns, but who is unworthy of confidence. Although discretion will be exercised, the publisher cannot always protect his patrons against misrepresentations and unbusiness-like methods by some manufacturers, as it is impossible to be all-wise; but we will heartily welcome just complaints, giving particulars. The pages of the Commercial Car Journal are sacred and must be as nearly pure as they can be made, so that there will be established a complete understanding and confidence between subscribers and advertisers. Co-operation, friendly and helpful, will make this idealistic condition possible.

## Regular Departments

Under special headings will be conducted departments as regular features of all issues of the Commercial Car Journal. Our Editorial Staff in conference decided the following to be important subjects for regular discussion:

Matters of Interest to Owners and Drivers.  
Instructive Experiences.  
Among the Manufacturers.  
Truck Accessories and Appliances.  
New Commercial Cars.  
In the World of the Electric.

Our subscribers are asked to offer their criticisms and suggestions as to whether these headings include all subjects which should be dealt with regularly, and also to let us know if the articles appearing in these departments are just what they require.

Letters addressed to our Managing Editor, Mr. E. S. Foljambe, will be greatly appreciated, as the regular departments are to be made a valuable feature of the

Commercial Car Journal and any ideas which you can tender which will be for the betterment of the reading pages will be sincerely welcomed by the Editorial staff.

## Foreign Department

Starting with our next issue, under this heading will be established a department which we know will prove of great value to our subscribers. We will have a regular correspondent whose duties will be to keep us informed of the best practices and new things which develop on the Continent.

Charles B. Hayward makes an analysis of Commercial Car Maintenance Cost.

It is a subject of such interest to the maker and user alike that we will conduct an economy competition which is described in an editorial in this issue.

Mr. William J. Johnson, who is one of the best writers in the Commercial Car field, and who is our special traveling editorial representative, contributes four especially interesting articles: "Delivery of Coal by Motor Trucks in New York City," and "Truck Depreciation and Some Erroneous Impressions."

"Satisfactory Commercial Car Service Depends Upon the System of Maintenance." Included in this article are some interesting metropolitan examples of how it is done.

Under the title of "Motor Truck Tires; How the User May Increase the Life of His Tires," will be a review of the tire situation together with descriptions of all the leading makes of tires. This is a subject of such a broad scope as to warrant its discussion for several months; hence this will be a continued article.

A short article by Mr. E. S. Foljambe on "Service Departments and What They Mean to the User," gives an idea of the thorough methods now being adopted by some makers.

There are many other important articles, including the "Wanamaker Method of Loading and Storage."

The department—"In the World of the Electric," will be devoted to the Electric Car industry, and will contain a section conducted by an official of the Electric Vehicle Association of America. Special articles or contributions will be made for future issues by the leading men identified with the electric branch of the industry.

## Motor Cars for Fire Departments

It is not surprising that every municipality is interested in the motor-driven vehicle for use in fire departments, when it is apparent that the Automobile combines the advantages of speed, efficiency and economy.

We have received data from Fire Chiefs of many of the principal cities in the United States, and so important and thorough is the information, we have decided to treat this subject in a most comprehensive manner. In subsequent numbers will appear special writings and tables showing the relative cost of operating motor and horse-driven fire apparatus. The advantages and disadvantages of the ancient and modern methods will be compared. This article is practical in every detail, and will be valuable as well as interesting.

## THE INFANT

BORN March 15th, 1911, hale and hearty and ordained to be a leader.

This briefly describes the first issue of the Commercial Car Journal. It is the offspring of the Cycle & Automobile Trade Journal, the leading and largest Automobile Journal in the world, and one of the most successful industrial publications in America. It has a good start and will grow rapidly for the benefit of the Commercial Car user, maker, seller and publisher. May they live long and prosper!

## A TOAST

Here's to the men who make the cars, which free the horse from toil;  
Here's to the dealers who risk their cash to work in virgin soil;  
Here's to the men who buy the cars and show they're up-to-date;  
Here's to the men who print the news before it is too late.  
So here's to the maker, seller, buyer, also he who prints—  
May the wheels of fortune never cease to give substantial hints.  
That the Commercial Car will prove to all, forever and a day,  
The means by which we one and all will make our business pay.

## New Commercial Cars

In this issue are illustrated and described Gasoline Cars of three prominent Manufacturers, and the product of one of the leading Manufacturers of Electrics. Descriptions of this character will be regular features of the Commercial Car Journal. And during the year cars made by practically all the leading Manufacturers will be dealt with for the benefit of our subscribers.

## Special Articles

Contributions will include important subjects from the pens of well-known writers who are authorities. In this issue Mr.



# The Autocar



## THE SATISFIED CUSTOMER

**R**EQUIRES the prompt delivery of purchased goods. The wonderful service which the Autocar Commercial Vehicles are giving is attested by owners and users in every line of business. They are reaching new territory in suburban delivery and are advancing city trade by their use.



Write for Commercial Car Catalog No. 2-C.  
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**THE AUTOCAR COMPANY FACTORY**  
**ARDMORE, PA.**

(Established 1897)

PHILADELPHIA

NEW YORK

BOSTON



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# The Commercial Car Journal

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VOLUME I.

PHILADELPHIA, MARCH 15, 1911

NUMBER 1

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## A National Efficiency and Economy Competition for Commercial Car Owners

While the use of motor cars for pleasure purposes has been so fully developed that a large percentage of the users of these cars know in a general way what service and performance to expect of them, commercial cars have not been used to any considerable extent and the indefinite general knowledge of pleasure car owners does not apply to the use of commercial cars at all.

There is a noticeable lack of dependable facts as to the performance of commercial cars. The proper method of operating them most economically and, at the same time obtain the greatest efficiency, is the problem the user of motor delivery and truck service is endeavoring to solve.

Thus far each has evolved his own methods or scheme of operation, hoping and, in some instances thinking, that the plan he is working under is securing the best results possible.

Others who have not succeeded in making a success of their motor service, have probably searched in vain for the cause of failure.

Because of the youth of this form of delivery and trucking all methods are still necessarily experimental. No owner or operator of commercial cars can be sure that his methods are the best and therefore everyone can learn from the combined experiences of all.

This in brief is the reason for the competition outlined below, for every participant will be able to judge whether the operation of his truck is costing too much, or whether he is accomplishing all that can be done with it by comparing its record for up-keep with others doing a like service.

### Outline of the Competition

This competition will be known as the COMMERCIAL CAR JOURNAL Efficiency and Economy Competition, and will be open only to commercial car owners.

Its purpose is two-fold: To demonstrate the effective and improved service and the economy and efficiency of commercial cars on one hand, and to promote carefulness and efficiency on the part of the drivers of the cars on the other.

The contest will extend over a period of six months, and will start in the summer, so that summer and winter weather will both be included.

The elements upon which the awards will be based are: The total distance covered, the total number of stops or deliveries, the total weight of loads hauled, the number of hours in service, the amount of fuel, oil and charging; the total cost of repairs and replacements, including tires, the cost of housing, the wages paid to drivers and helpers, etc., etc.

The cars will be divided into types and sub-divided into classes, so that the service or work performed by all the vehicles in each class will be as nearly the same as possible.

A car owner may enter as many cars in the competition as he wishes, therefore, if he enters a number of cars he promotes a spirit of competition for efficiency among his drivers.

### There Will be No Entrance Fee

To assist entrants in the keeping of accurate records, daily blanks will be furnished which can be filled out in a few minutes after each day's work by the driver, and weekly or monthly blanks on which a summary of the week's or month's work can be made by the owner.

Suitable trophies will be given by the COMMERCIAL CAR JOURNAL to the winning car owners in each sub-division, and cash prizes for the winning drivers. Additional prizes will be offered by several prominent manufacturers to owners of their cars who make the best records.

The awards will be made, and all questions arising during the progress of the competition will be adjusted by a referee, assisted by a committee, all of whom will be well known disinterested experts, who are not connected with any concern manufacturing motor cars or parts or with any of the competitors.

Before the definite details of the conditions are finally decided, they will be passed upon by a number of large owners of commercial cars and by makers and agents, also, so that they will be sure to meet every possible condition fully. When these have been formulated they will be published in the COMMERCIAL CAR JOURNAL and sent to every commercial car user.

The names of entrants will be published in each issue of the COMMERCIAL CAR JOURNAL, with descriptions and photograph of the car or cars used and full details of the service it is performing while entered in the competition.

This will be the first competition for commercial cars on such broad lines, and it is not an exaggeration to say that every entrant in this competition will benefit in a manner that will mean dollars saved, because each will be sure to glean something to his advantage.

By entering into this competition and aiding in its successful completion the merchants who are greatly interested in the cost of delivery and trucking, will assist in the collection of data and information that will be of the greatest value to them all.

One of the principal results gained will be that the merchants who enter a number of cars will learn the comparative capabilities, economy and efficiency of their drivers, and the very fact that each driver is striving to win a prize in the competition will be sure to make a difference in their work, which will be greatly to the employer's benefit.

The matter of sub-dividing the classes so that fair com-

petition will result we realize will be one of the most difficult problems, as the conditions under which trucks and delivery wagons are operated differ so very greatly. A two ton wagon may be used by one concern for short hauls from warehouse to freight station, by another for long hauls from one town to another, making probably twenty or twenty-five deliveries, by another for long hauls for one or two deliveries each, or by another for a number of short trips either with a small or large number of deliveries each.

Another feature which will deserve very careful consideration is the verification of the records, or rather making sure that the reports turned in are correct, that they are not juggled or distorted in any way.

We would like to have suggestions on these points particularly and also on any other feature of the competition. In relation to the classification, it is possible that a method of awarding points for number of deliveries may simplify this to some extent.

One proposition is that the cars be divided, first, into the following five general types: Delivery cars, trucks, taxicabs and omnibuses, fire wagons and public service cars. Then divide the delivery cars into classes as follows: Class A, 250 to 900 pounds; Class B, 1000 to 2000 pounds; Class BL, same weight cars making long hauls; Class C, 2000 to 4000 pounds;

Class CL, same weight cars making long hauls; and the trucks into classes as follows: Class AT, 3000 to 5000 pounds; Class BT, 5000 to 9000 pounds; Class CT, 9000 to 13,000 pounds, and Class DT, over 13,000 pounds.

It will be seen from this that the heavy delivery class and the light truck class overlap. The idea of this is to afford an opportunity to place cars in the class according to the work they are doing; that is, to range the delivery classification up as high in capacity as the highest capacity wagon used for delivery purposes, and the truck classes down as low as the lightest capacity truck in ordinary use.

With this division and the awarding of points for the number of deliveries per mile of distance traveled cars will be placed upon a fairly equitable basis.

The other types of cars can have classifications which will apply particularly to them.

It may also be advisable to make special classes for electric vehicles, and we would especially invite the opinions of electric commercial car owners on this point.

We sincerely hope that our readers will give us the assistance of their views and opinions on the various phases of this competition, and we would also say that entry blanks will be furnished on request to any commercial car owner who desires them.

## The Boston Show

The Ninth Annual Boston Show, which opened on Saturday, the 4th of March, was the last of the large shows of the season. The floor space of 126,000 sq. ft., or one-quarter larger than any previous show, was covered by exhibits and the audience to such an extent of crowding that much more space could easily have been used. Two buildings were used to house the exhibits, Mechanics' Building and Horticultural Hall. If there is one thing in which the Bostonians rejoice, it is music, and four orchestras in various parts of the two buildings, made the show doubly attractive to music lovers. To those who were accustomed to the constant buzz of conversation regardless of the music at the New York and Chicago Shows, the way Boston people stopped to listen when the nearest orchestra struck up was, to say the least, quite striking. On the opening night especially was this noticeable, the crowds, most of whom came for pleasure only, stopped still in their tracks on hearing an opening chord. The decorations did not cover the building as completely as the music did, and bare patches of walls were visible in many places above a sort of panel or wall paper. However, the effect was far from unpleasing and when one stopped to analyze the materials, such as bunting, card board "marble," red wall paper,

greenery and lattice work, one could but admire the ingenuity and thriftiness with which the management had decorated the buildings. Lattice work, covered with Australian maiden-hair fern, which latter strangely enough was covered with white, pink and purple blossoms, formed a feature of Exhibition Hall. The ceiling was treated with broad bands of bunting, large chandeliers and ropes of electric lights. The lower halves of the walls were covered with blue bunting, and were also adorned with paintings, showing road scenes in various parts of the world, all emphasizing, of course, the universal appeal and utility of the automobile. Grand Hall, joining Exhibition Hall, is really the show place of the building and was treated as such in the decorations. With columns of

white "marble" twined with illuminated flowers and topped by golden eagles or Scamozzi Capitals, the scene was one of pleasing, but not too elaborate effect. The ceiling was treated with bunting, giving a misty effect which covered the bare rafters with a haze which only suggested their form without offending the eye. Elaborate baskets of flowers, all illuminated, lent a pleasing touch among the chandeliers. It will be remembered that Boston started the idea of uniform decoration, which was carefully carried out



Commercial Vehicles at the Boston Show.

in the last show. The exhibitors' signs consisted of large wood ovals, upon which were painted the distinguishing trade name of the exhibit. Beneath this was a circle enclosed in a wreath bearing the name and address of the exhibitor, the whole being mounted on a neat wooden hat rack sort of stand.

Horticultural Hall is several blocks away from the Mechanics' Building and housed the overflow exhibit. Here, the decorations were characterized by their absence, one might say, American flags and potted plants being the only decoration. Due to the general lay-out of the building, however, the effect was not unpleasing, the exhibits being tucked away quite cosily in a suite of four rooms on two floors. A few cars and accessories crowded out of the main buildings constituted the exhibits. The only fault to be found was that the display, being drawn from every division of the show and not confined to one or two divisions, the impression was rather small and disappointing due to a sense of incompleteness.

That the Boston show is really, after all, only a local show was evidenced to those who made a careful study of the spectators. Typical New England Yankees aren't found everywhere in numbers, and were not noticeable at either New York or Chicago. That they are somewhat different from other Americans was evidenced by the way the salesmen handled their prospects. The slow, shrewd Yankee who is going to get the most for his money, demands a treatment somewhat different from the man from the Bonanza parts of the West, who does not particularly care sometimes about how he spends the money which he has acquired with little difficulty. The Yankee, however, makes his money by an amount of hard work which acquaints him with its value, and when he decides that he can spend some of it for a car, he is going to get the most value for his money that he can. It was noticeable that the New Englanders walked around and looked, and that the salesmen confined their activities to a great extent in answering questions, with here and there a suggestion, apparently realizing the futility of the sort of "hot air" which might prevail with a more reckless and slapdash community. It was evident in all the orders that were placed, that careful study had been given to the subject of

getting a car which would best suit the prospective owner's needs as well as pocketbook. That this study went into careful detail was evidenced time and again. Men who admitted that they had been interested in the automobile for but a short time, interviewed the exhibitors with respect to length of wheel base, and the respective merits, full-elliptic and platform springs and discussing interestedly the respective merits of long and short stroke motors.

Additional interest was lent the show by the fact that twelve pleasure cars and six trucks were exhibited for the first time this season. The commercial cars were housed in the basement of Mechanics' Hall. Among them, one which attracted attention immediately was the Harrison truck, made by the Robert Harrison Co., of South Boston. This was noticeable immediately on account of the reach rod between the front and rear axles, fashioned after the regular wagon construction. The spring suspension also has several original features. The Speedwell Motor Car Co., of Dayton, Ohio, exhibited for the first time a two-ton truck as a result of their quiet experimenting in building commercial cars. A Wilcox three-ton chassis with an enclosed driver's cab, made by the H. E. Wilcox Motor Car Co., of Minneapolis, Minn., was seen. The largest commercial car in the show was a seven-ton vehicle made by the W. A. Wood Co., of Kingston, N. Y. It will be remembered that this concern is building the Commercial cars which have been unusually successful in England. In contrast to this heavy truck was the new "Hoosier Limited," a new commercial car exhibited by the Decatur Motor Car Co. Among the older makers, the White Company had a number of their commercial cars on exhibition, among which a three-ton truck made for the Coes Wrench Company attracted attention because of the novelty of its signs.

Altogether the commercial car exhibit was exceedingly pleasing. Last year 62 commercial vehicles were displayed as against 40 the previous year, while this year 95 complete commercial cars were exhibited as against 89 in New York and 149 in Chicago. When it is remembered that the total number of exhibitors was greater, some idea may be had of Boston's achievement in exhibiting 95 commercial cars.

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## COMMERCIAL VEHICLE SHOW AT KANSAS CITY

Kansas City's two motor car shows, held within a week of each other, mark the beginning of a new era in the use of commercial cars in the Southwest, according to dealers. Kansas City has two factions of dealers, hence the two shows. Whatever else the dealers may disagree on, they are united in the opinion that much has been accomplished for the truck trade.

The first show given by the Motor Car Trade Association, was held the week of February 14-19. The second, under the auspices of the Kansas City Automobile Dealers' Association, opened February 27, and closed the night of March 4. Both shows were highly successful from the point of sales, but the strong feature of each was the educational campaign in behalf of trucks. A large manufacturer of commercial cars was represented in both exhibits. Large amounts of advertising space were utilized, and trucks carrying "overloads" buzzed through the streets at all hours.

Kansas City is a heavy buyer of trucks. Every line of trade, from the undertaker to the proprietor of the cat and dog hospital, finds a use for the commercial automobile. Trade in this line has increased nearly 100 per cent. within the past twelve months, and an even greater increase is expected for the coming year.

The topography of Kansas City affords opportunity for frequent and severe tests of the big freight carriers. It is almost impossible to reach the retail and wholesale districts without encountering team-killing hills. In spite of the work of the Humane Society, horses are short lived here and soon succumb to the steep and frequent grades.

The municipal authorities of Los Angeles, Cal., have reached the conclusion that it is much cheaper to operate the auto patrol wagon, which they purchased a year ago than horses, and that it gives more all round satisfaction. The patrol originally cost the city \$4000. It has been in use nearly every day since it was first installed, and has covered more than 26,000 miles.



## SOUTHERN CITY TO HAUL GARBAGE AND ASHES BY MOTOR TRUCKS

MEMPHIS, TENN., will soon have its garbage and ashes hauled to the incinerators in motor trucks, that is, if the plans of Dr. M. Goltman, superintendent of the city's health department, do not fall through. The plan is to establish platform stations in various sections of the suburban districts where the carts will unload into receptacles to be later picked up by the motor cars. The carts will also likely be divided into two compartments, one for ashes and one for garbage, as a means of doing away with the two trips required by the present system.

The haul to the crematories is said to be about three miles and a half, a round trip of seven miles. The trip is held by Dr. Goltman as entirely too much for any mule to make three and four trips a day.

The installation of motor cars will cost considerably less than with mules and wagons, which it is estimated would cost the city about \$60,000.

## CHICAGO MEN ORGANIZE

Following the example set by the pleasure car dealers, the Chicago commercial car dealers have perfected an organization, with the betterment of trade conditions in that city as the prime object. That more than two score men in Chicago have been enrolled is itself an indication of the amazing advancement of the motor truck in the everyday life of the business world.

The officers of the new organization are: Henry Paulman, President; E. W. Curtis, Jr., Vice-President; A. P. Lee, Second Vice-President; J. E. Plew, Secretary; L. C. Long, Treasurer. The name of the body is the Motor Truck Association of Chicago. As soon as its "machinery" gets into working order it will doubtless become a factor, both for the things for which it will stand and what it will accomplish.

## EXPERIMENTING WITH COUPLE GEAR TRUCKS

An experiment, which is being observed with interest, is now being conducted by the New York fire department with a couple gear short truck chassis as a means of hauling about a water tower. This piece of apparatus was somewhat cumbersome. The front wheels are removed and the truck secured to the couple gear chassis. From information given out it is said that if the scheme works to the satisfaction of all concerned the outfit will be purchased.

A horse drawn fire engine was also recently coupled to a chassis of the above type merely to demonstrate the feasibility of the system.

CHARLES H. MARTIN, sales manager of the Morgan Truck Company, has resigned his position, to take effect at the close of the Boston Automobile Show. Mr. Martin will devote his time to developing an entirely new idea in motor truck design, which he claims will materially reduce the first cost of equipment and cut present operating costs in half. He accomplishes this result by eliminating much of the complication of present practice.

## TRUCK CONTEST ROUTE CHANGED

The route of the commercial vehicle test, being promoted by the Chicago Motor Club, has been reversed, the club's contest committee deciding at a recent meeting to start from New York instead of Chicago as originally planned. This action was taken because it was thought that the contest would receive more publicity and be of more benefit to the entrants and truck manufacturers generally. Despite adverse criticisms, which have been heard, the contest committee is energetically going ahead, with every likelihood of success. Entry blanks are not as yet out, but a number of tentative entries have been made, the Alden Sampson, Alco, Morgan, Saurer and De Dion people showing considerable interest. It is probable that the Alden Sampson entries will include their road train besides several trucks.

## ST. LOUIS ASKS FOR BIDS ON AUTOMOBILE MAIL SERVICE

To improve the downtown collection of mails and transportation from the Post Office and its branches to and from Union Station, Uncle Sam may have eight auto wagons operating, beginning July 1. Second Assistant Postmaster General Joseph Stewart has asked for bids on the transportation of mails either by screened wagons or automobile service. The bids should reach Washington not later than March 21, 1911. Details of routes are on file with Assistant Postmaster E. F. Martin. The present annual contract amounts to \$22,925 for eighteen wagons a year.

## MOTOR TRUCK ASSOCIATION AIMS TO REDUCE WHEEL TAX

The Motor Truck Association, of Chicago, has recently appointed a committee to confer with Chicago Association of Commerce and other bodies which are hostile to present terms of the city's wheel tax. One of the main objects of the association is to obtain a reduction of the wheel tax and a better distribution of its revenue. The tax on light delivery wagons is \$15 per annum, and on heavy duty trucks \$30. This wheel tax revenue has netted the city \$560,000, from May 1st, 1909 to the beginning of the present year.

It is a well known fact that in large cities in stormy winter weather horses are at a great disadvantage because of their inability to obtain a footing, even when sharply shod. It is rather distressing to see these poor beasts floundering about helplessly, and traffic is often completely stopped. The trolley men very often come to the assistance of drivers in New York City in winter, by running up behind a stalled vehicle and pushing it along the tracks until the horses are able to obtain a footing. In this respect the commercial car is a friend in need. A large coal truck, used by Curtis Blaisdell in New York, is equipped with a heavy cable and a pair of hooks. When the driver encounters a horse coal team in difficulty, he simply secures the hook to the end of the wagon pole and hauls the outfit along until the horses are able to care for themselves. The scheme has proved helpful on many occasions.

# THE COMMERCIAL CAR JOURNAL

Vol. I. PHILADELPHIA, MARCH 15, 1911 No. 1

Published the 15th of each month by the  
**CHILTON COMPANY**

Market and 49th Streets Philadelphia, U. S. A.

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United States and Mexico ..... One Year, \$1.00  
Other Countries in Postal Union, including Canada ..... One Year, 2.00

Make checks, money orders, etc., payable to Chilton Company.

Change of Address—Subscribers desiring their address changed, should give the old as well as the new address.

## CONTENTS

|                                                   | PAGE |
|---------------------------------------------------|------|
| Among the Manufacturers                           | 61   |
| An Analysis of Heavy Commercial Car Costs         | 10   |
| Autocar Commercial Cars                           | 32   |
| Baker Commercial Electrics                        | 44   |
| Boston Show                                       | 4    |
| Coal Delivery by Motor Trucks in New York City    | 54   |
| Commercial Car Service Departments and Their Work | 14   |
| In the World of the Electrics                     | 47   |
| Instructive Experiences                           | 52   |
| Matters of Interest to Owners and Drivers         | 50   |
| Motor Truck Tire Deterioration                    | 17   |
| National Efficiency and Economy Competition       | 3    |
| New Commercial Cars                               | 32   |
| Pierce-Arrow Worm-Drive Truck                     | 39   |
| Resume of Commercial Vehicle Tires                | 56   |
| Satisfactory Service Dependent on System          | 21   |
| Solid-Pneumatic Tire, A                           | 60   |
| Truck Accessories and Appliances                  | 56   |
| Truck Depreciation—Some Erroneous Impressions     | 28   |
| Universal Three-Ton Truck                         | 36   |

## ADVANTAGES OF MOTOR TRUCKS IN ADDITION TO THEIR ECONOMY

It is believed by many that too much stress is laid upon the actual cost of delivery by commercial cars as compared with doing the same work by older methods. Although it has been proved beyond question that the commercial car, when properly installed, operated and cared for, is more economical than the horse, yet this is by no means the all-important feature that it is sometimes considered.

The use of commercial cars for delivery purposes offers so many advantages to the up-to-date business house that, even though the feature of economy was not an assured fact, yet

would trucks come just as surely into universal use. The advantages are not by any means restricted to one class of service, but are such as to offer inducements to the user in almost any line in which he may be engaged.

Aside from the direct advantages to the user there are also the broad and sweeping improvements which can be effected in respect to cleanliness of our city streets, a point which is by no means being overlooked by the sanitary and health departments. Congestion of traffic which, with the use of cumbersome horse vehicles, is daily growing worse, would be greatly relieved by the general adoption of motor driven trucks; in fact the facility with which these machines can be manoeuvred in crowded streets, their comparative shortness as compared with the horse drawn truck, and their more perfect control, have already inclined the traffic police toward favoring them. These men realize that at a wave of the hand these machines can get away quickly and pull out of the congestion, therefore relieving the situation, and it takes but a casual observer to note the preference which these experienced traffic policemen already show toward the modern method of delivery. This saving of space on the street in wholesale districts, where the machines are backed to the curb, is very noticeable, allowing a clear unrestricted passage through the center and many more vehicles to the curb for a given distance than was possible with horses. The saving in space to the owner, in the way of more compact garages, is also an important and by no means negligible item. The stabling of a large number of horses in or near the business center is a most costly feature of this service, not only due to the large amount of space required but in view of the objectionable features of stables. Contrast this with the clean and wholesome conditions surrounding an up-to-date garage for commercial cars. In one case everybody avoids the vicinity and values are depreciated, the upper parts of the stable buildings are practically useless for offices, while with motor trucks handsome buildings many stories in height can be used as garages with repair shops, salesrooms, etc., while the upper parts of the building can be utilized for offices and the neighborhood improved rather than disfigured. The disadvantages of stabling horses in the center of the city near their work has led to a custom, especially among the large stores, of stabling near the outlying districts, where land is cheaper, houses not so closely set and the nuisances of a stable less objectionable, but this means a long trip for the horses in the morning and again at night, sometimes amounting to as much as eight miles, which on a conservative estimate is more than a third of the distance horses in such service can be driven daily. Here is a tremendous waste of energy and time. The commercial car could stand such a trip much better than the horse, but owing to the smaller space required for its housing has the additional advantage of being close to the center of operations.

Not only is there a large saving in the space but also in the number of men required, as a motor truck of size can easily be handled by one man and take care of the work which ordinarily required at least two horse wagons. In the stable itself less help is required, and of course there is the well-known advantage that the expense for operation ceases on a motor driven vehicle when its work is done, while with horses there is the continual cost of feed and stabling.

But all of these matters are comparatively unimportant when weighed against the better service obtained from com-

mercial cars. The large territory which can be easily taken care of promptly has opened up new possibilities to many a firm. Districts in which deliveries were never made by wagon and in which patrons had to wait at least a day and sometimes a longer period to receive their goods, which were turned over to suburban delivery companies or had to be carried by train and handled several times, are now brought within easy range, goods being delivered the same day as purchased and in some cases before the purchasers themselves have reached home. What this satisfactory service means to the patrons is well known by business men, and if for no other reason than this alone the commercial car is bound to be universally adopted within the next few years.

With commercial car delivery the weather is not the important factor that it once was to the head of the delivery department. Icy, slippery streets due to a drizzling rain gradually freezing, is sufficient to demoralize the delivery service of almost any large store where horses alone are used; with a loaded commercial car equipped with anti-skids such conditions make almost no difference whatever with the efficiency of their performance, the tires with their iron devices cutting through the slight ice surface, which, if anything, gives them an increased traction. During blizzards and snows, when heavily loaded horse drawn trucks are absolutely stalled, motor trucks can easily buck the drifts with an untiring energy limited only by the amount of gasoline or current supplied and the endurance of the driver.

Not only will the motor truck relieve congestion, but it will also relieve much of the noise which is now beginning to be considered as a nuisance and even as a menace to humanity in the closely packed business centers of our large cities. Rubber tires move noiselessly even over the roughest pavements, and the pavements themselves will gradually be changed as the use of these up-to-date carriers increases. Instead of rough cobble stones there will be wood blocks or other forms having comparatively smooth surfaces.

The advantages of motor driven vehicles for delivery are in fact so numerous that they cannot be discussed in an article of this length, and all these are features entirely distinct from that of the mere cost of operation.

Unfortunately the prospective user as a rule does not know of these great advantages and the adoption of commercial cars into his service is almost always based solely on the actual cost of doing the work, overlooking the main and vital advantages which surely come with the use of commercial cars. Owing probably to this attitude on the part of the purchaser, the average truck salesman is led into the same error and is devoting almost his entire time and energy to the subject of cost of operation. This is a grievous mistake and one which should be taken up by the various associations of dealers. The commercial car is new, represents a new development, and it is wrong to attempt to measure its performance by the insufficient and antiquated rule of the horse.

### COMMERCIAL DEMONSTRATION ABUSES

That a merchant who is considering the adoption of commercial cars for delivery, or for use in his transportation of goods, should desire a demonstration is most natural, and is of great assistance to that merchant in making his selection. Demonstrations have always been given since the motor car industry began, and in all probability will continue to be given

for some years to come. Very soon the pleasure car makers and dealers found, however, that a small percentage of their prospective purchasers were simply getting what they could out of them in the way of pleasant rides in the summer afternoons and evenings. These few, invited cars from various dealers and in some cases enjoyed motoring for a large part of the summer at the expense of the over-anxious dealer. It is but natural that somewhat the same experiences may be repeated in the now rapidly developing commercial car industry, and already it has been found that there are those who are perfectly willing to have their goods delivered and their long and heavy hauls made without expense to them, just as long as the inexperienced truck dealer is willing to serve them.

In a certain specific instance brought to our attention, a merchant had practically all of his trucking done for him for over a period of two months, without a cent of expense, by over-zealous commercial car agents. It is true that these are exceptional cases, but there is a growing feeling among the best merchants that it is not right to ask any dealer to put into his business a commercial car driver, helper, or perhaps two machines, and deliver his product for an extended period without his paying a reasonable compensation for the work being done. We, of course, are speaking of such instances as require the use of commercial cars for a more or less extended period, in order to determine, not whether they will run a day or two days successfully but to show to the merchant how he may best rearrange and reorganize his delivery service so that commercial cars may be used to advantage. The use of machines during such an extended period as a week or two, is not so much a test of the trucks, as it is a means of determining for the prospective user how motor vehicles can be advantageously applied to his special work. The commercial cars of any reputable maker to-day are perfectly capable of carrying their rated loads without hitch or trouble for a day or two days. This is no test of the machines. Such a tryout will, however, show the merchant in some lines of work, what method to follow in arranging new routes, and how many cars will be required. Any dealer is, of course, willing to do this for a live prospect and the customer himself should expect this much on the part of the dealer. Beyond this, however, it is not usually necessary to go, but where it is, the merchant should be willing to pay at least a nominal figure for the actual service rendered by the machines and men during any extended period of service. The part of this rental which was for the car, gasoline, oil, etc., might be made to apply on the initial cost of the new installation if finally purchased.

Under certain conditions merchants are able to dispense with the services of some of their drivers, rented horse trucks, etc., during an extended try-out of the new method. This, of course, making a saving to them. When a rental is charged, the drivers, assistants and others endeavoring to rearrange or mould the merchants' delivery methods for the use of commercial cars will be more free to give their entire time and attention and the machines can be in service long enough to do a systematic piece of work, especially if sufficient is charged for this service to at least cover the actual expense to the dealer. The bona fide purchaser loses nothing by this, as he is simply paying for services rendered and rendered usually in a much more satisfactory manner than he has been accustomed to, thus pleasing his patrons and extending his business. If the trucks are purchased most dealers would be will-



ing to have this charge, or at least that portion which was for the service of the cars, applied to the cost of the machines being adopted.

The merchant must not lose sight of the fact, that a commercial car dealer is not simply a salesman in the moral sense, but if successful, must be a capable transportation engineer and delivery system reorganizer.

Some such arrangement which would be very acceptable to both the dealer and prospective purchaser could undoubtedly be devised to standardize and make uniform the practice of various dealers in regard to such rental of cars in extended demonstrations, and should be one of the first duties of the organized dealers.

### THE FALLACY OF LONG DISTANCE CROSS-COUNTRY COMMERCIAL CAR CONTESTS

During the Chicago Show preliminary steps were taken to promote a commercial car run, or contest, from New York to Chicago or vice versa. This meeting brought out very diversified statements by the various makers, and of course a willingness on the part of some few to enter their product in any kind of a contest which might be decided upon by the well-known Chicago Club. Whether such a competition will actually be held is yet in a way problematical. At this stage, however, we feel that a word of warning should be given and some of the fallacies of this kind of a competition pointed out.

We do not question that there are trucks which might successfully make such a run under favorable circumstances, but what would such a competition show? This is not the field of the commercial car at the present time, nor for some time to come. We do not deny that the commercial car, even at the present time, is forcing its way into competition with even the railroads for suburban and interurban transportation of goods, but this is a very different matter from attempting to drive a heavily loaded truck over a thousand miles of good, bad and indifferent roads. For suburban work over moderately well kept roads the present motor truck is well suited and has already shown its ability to transport goods at less expense than they can be handled by railroads. This, of course, is largely due to the fact that one loading and one unloading is all that is required, while shipment by railroad means one loading and an unloading at the train, a loading of the goods into the train and an unloading and loading again to some means of conveyance at the other end of the line, and a final unloading at the place of delivery.

It is a mistake to attempt a thousand mile cross-country run over American roads with vehicles weighing loaded from two to fifteen tons. Bridges are not suitable and will have to be rebuilt or at least propped and strengthened. The road surfaces which would necessarily have to be negotiated are entirely unsuited to such vehicles, the hills that would be encountered, soft with mud, would find no place whatever within the confines of any city where trucks would be called upon to deliver goods.

The clearance of the average truck is not at all suited for cross-country work and the best of machines might easily be put out of commission by striking a raised rock or other obstruction; while a more fortunate driver who passed the same route might escape without damage.

We do not believe that such a contest would either prove

that the modern truck is suited for the work it is intended to do, or be in any way the means of forming a just comparison of the relative performances of the various entrants. Better by far have a competition totally within the confines of a large city, with the entire route over city pavements and under conditions more nearly those which the car will actually meet in the hands of the user.

### PERPLEXING QUESTIONS ANSWERED AND EXPERT ADVICE GIVEN

The COMMERCIAL CAR JOURNAL is prepared to answer any question propounded by our readers in relation to motor delivery or motor truck service, and as to the operation and handling of commercial motor cars; also to give unbiased advice as to the best type of car for any class of work, and the best way to handle any particular character of hauling.

The large staff of special contributors which has been gathered together for this journal enables us to make this offer.

These contributors include men who have had long experience in every branch or phase of the business, and whose knowledge and opinions are sure to be a valuable aid to all who are seeking information.

These questions and answers will be published in each issue, so that all of our readers will thereby benefit, but the name of the writers will not be used.

We also ask our readers to give their opinions on any question asked, if in their opinion the answer given does not fit the question fully, or is not the correct answer as they see it, for we do not claim that our staff is infallible.

Do not hesitate to send in your questions. We want you to make full use of this department.

If you are not convinced as to the advisability of adopting motor cars in your delivery work, put the points you are in doubt about up to us.

If you are using commercial cars, and are not satisfied with the results or have run against some snag let us help you out of your trouble.

If you are having difficulty in keeping your car in continuous service or in locating some trouble with its power plant, we or some of our readers can be of assistance to you.

If you are having difficulty in routing your deliveries, or in your loading or unloading facilities our experts on this branch of the business will give you the benefit of their experience.

By all means put the questions up to us; we want to hear from you.

### OUR SUGGESTION AND CRITICISM DEPARTMENT

This will be one of the regular departments of the COMMERCIAL CAR JOURNAL, and its object is to give our readers an opportunity to voice their opinions on any subject which they consider of importance to the commercial motor car users or manufacturers. To offer criticisms on any practice which is in vogue, or on any type of construction which they consider erroneous, or on any opinion or statement of ours or our contemporaries with which they do not agree.

Also to offer suggestions for improvements on these prints, or on any other subject which they may feel is of sufficient importance to the commercial car public.

## An Analysis of Heavy Commercial Car Maintenance Costs

BY CHARLES B. HAYWARD

Figures are one of the hardest things to obtain regarding the performance of motor trucks, despite the fact that the latter have now been in successful use in widely diversified industries for several years past. Some users of trucks are satisfied to note the saving as compared with horse haulage in a general way, and let it go at that—the fact that motor haulage is a success in their particular case is sufficient, and as new equipment is needed horses are replaced by motor trucks. In other cases where exact cost data is kept track of and calculated out to the third or fourth decimal fraction, including every possible item of expense, the result is the same—more motor trucks are added and more horses are discarded. But

in the latter case, the users are very chary of making their actual maintenance costs known. In the first case, the figures would not be of any great value; in the second, they are usually unobtainable, so that between the two general classes of motor truck users, even the manufacturer finds himself somewhat at a loss to supply reliable data upon which to base calculations. This makes the appended figures of particular interest to the prospective, as well as to the actual user of motor trucks, as it indicates to the former just what may be expected under actual service conditions in all kinds of weather, and it affords the latter an excellent basis of comparison by which to check up his own expense account for transportation.

The writer has had more or less occasion to investigate the subject at great length in the past, but has always had to rely upon more or less uncertain quantities in this respect—usually the manufacturer's estimate of maintenance costs. Experience has usually shown the latter to be approximately accurate in practically every case, but they are naturally not as convincing to the prospective purchaser of motor truck equipment as figures that are based directly upon actual service. Special interest accordingly attaches to the accompanying schedules as they are based upon the maintenance costs shown by daily use. This is more particularly the case, as all the figures are equally accurate, it frequently having been the case in the past that schedules have been composed partly of actual service figures and partly of estimated costs, or, what is even more misleading, have only been based upon a very short period of service.

Another factor that has tended to render the value of the figures doubtful has been the comparison on practically the same basis of light and heavy vehicles. In the present instance, this has been avoided by confining the comparison to the maintenance costs of five and ten ton trucks, and the showing of both as compared with the cost of the same service rendered by horses.

### No Great Increase in Maintenance with Age

The first is a five ton Hewitt truck operated by the NEW YORK TELEPHONE COMPANY, the figures extending over a period of three years. One of the most striking factors brought out

by an analysis of this schedule of costs is that of the average monthly expense, as it provides an unmistakable answer to the query so commonly raised by the uninformed as to whether the expense of running a truck does not increase to such a disproportionate extent after a few years service



The New York Telephone Co.'s Truck.

as to make its further operation of doubtful profit. In other words, it shows that the percentages of depreciation usually figured on a few years ago were excessive. For instance, the average monthly cost of running this five ton truck during the first twelve months was \$273.67; during the last year of its service covered by the figures, it was \$301.36. The second year showed a drop from the first to \$257.22, making the average for the entire period \$277.42, or an increase of less than 2 per cent. for the three years over the costs of the first year.

The average number of working days per month for the entire period was 24 2-3, while the total operating cost per day was \$10.86 for the first year; \$11.14 for the second, and \$11.97 for the third, making the average \$11.32. Adding interest on the investment at 6 per cent., the cost of insurance at 8 per cent. and depreciation at 12½ per cent. per year, the average cost per working day for the third year (302 working days) was \$14.85, while the average cost for the three years (890 working days) was \$14.15.

Analysis of the monthly costs as compared with similar tables of horse drawn truck maintenance shows a substantial difference in the favor of the latter where the driver's wages are concerned, in view of the fact that skilled labor is required

in the case of the motor truck. For instance, the average wage account per month for the years of the five ton truck in question was \$112.57, \$110.75 and \$120.11, making the average for the period \$114.48. The average cost of supplies and repairs for the three years was \$44.58 per month, this covering gasoline, lubricants, tires, miscellaneous supplies and any repairs required to keep the truck in operation, exclusive of garage attendance, which alone averaged \$32.84.

The average daily mileage for the three years was but 18.56, which is due to the fact that the truck is employed quite as much in stationary service as it is in traveling about. It is employed for taking cables, supplies and crew to the scene of operations, and once there it is set to work hauling the heavy lead-covered telephone cables through the conduits, being provided with a special winch for this purpose. This results in a lowering of the factor of tire expense, but the motor

is run as constantly as that of a truck used solely for transportation, so that the consumption of fuel and lubricants would be approximately the same. However, it makes the cost per mile for these items apt to be misleading in view of the fact that the car was standing idle much of the time that it was working. But it adds to the favorable showing on the right side of the ledger, as when horse drawn trucks were employed to transport the cables and other paraphernalia, the cables had to be drawn through the conduits by means of a crude

hand winch or capstan manned by three or four laborers, so that the saving in labor charges alone was greatly to the advantage of the motor truck. A study of the table giving the detailed costs per day, and per month in connection with the mileage will be found of interest as showing what steady service a truck of this size and type is capable of rendering. Unfortunately, no figures are at hand to afford a comparison with the cost of performing the same service with horses.

This, however, is available in the case of another five ton Hewitt gasoline truck employed by the Rockdale Ice Company, of Tarrytown, N. Y., although in this case the figures do not extend over as long a period. But, judging from the experience of the telephone company and other users of these trucks, it is safe to assume that an equally favorable showing can be made year after year, there being a slight increase in the operating expense, as already pointed out.

### Freighting Ice by Commercial Car

The truck in question is employed for freighting ice from a hygeia ice manufacturing plant to the distributing depots, the round trip mileages between the plant and the different stations being 4, 12 and 17 miles respectively. The roads are part dirt and part macadam and there are some hills, but the truck is only loaded one way, returning empty. The average speed is 7 miles an hour, and the average load is slightly over

5½ tons. To perform the same work as is carried out by this one five ton Hewitt truck, an average of 4.7 teams and wagons was formerly necessary. The investment represented by the horses and wagons totalled \$5,405, while that of the motor truck is \$5,000. The cost per ton mile, which means but little to most people, showed a saving in favor of the car, but by comparing them by the day and month, the saving is made very apparent.

The maximum mileage of which a horse truck is capable per day is 20; the average distance covered by the truck per day in service is 42 miles. For the horses and wagons, the total daily cost at \$4.50 each, amounts to \$21.15; for the motor truck it is but \$12.97, including every possible item of expense, making the daily saving \$8.18, or \$212.68 per month. This does not take into account the fact that the horses and wagons required five times as much space as the motor truck, nor the

saving accomplished by the much quicker delivery at its destination of such a perishable product as ice. As the business is naturally heaviest in the warmest weather, this should represent an item that is not negligible by any means. The figures upon which the comparison of the performances of horses and wagons and the motor truck is based, are not estimated nor in any way theoretical, but are the result of actual experience. A good team of draught horses hauling a 2½ ton load can average 20 miles per day in regular service, i. e., 10 loaded



Type of Truck used by Rockdale Ice Company.

and 10 light. That gives 10x2.5 equals 25 ton miles, representing the amount of work that one team and driver can do in a day. The lowest daily average ton mileage for the motor truck during its entire busy season of four summer months was 117 ton miles; the highest 145, the average for the period, 134.25 ton miles. But as the comparison between the two already referred to is based on the June service, the figures of 117 ton miles is taken, so that we have 117 plus 25 equals 4-7.

### Amount Saved by the Truck

For July, 5.5 teams and wagons would have been necessary, making the daily cost \$24.75 as against \$13.31 for the motor truck, or a net saving of \$11.44 per day and \$274.56 for the month. In August, this increased to 5.8 teams, costing on the same basis as previously, \$26.10 per day; motor truck \$13.42; daily saving \$12.68; monthly saving \$329.68. For September, the total difference in favor of the motor truck was \$298.48, owing to the decline in the amount of ice transported as the season drew to its close. During the three months for which these figures are given, the initial investment in horses and wagons required exceeded that of the motor truck by \$1,325 in July and September and by \$1,670 in August. Such equipment would have to be acquired quickly and at top prices, and once the rush was past, would either



**TABLE NO. 1**  
**Cost of Operating 5-Ton Hewitt Gasoline Truck for Three Years,**  
**August, 1907, to August, 1910**

|                            | Wages  | Garage | Gasoline Gal. | Cost  | Oil Gal. | Cost  | Tires | Sup. & Reprs. | Monthly Cost | No. of Wkg. Days | Cost per Day | Average Monthly Mileage (See Note) | Daily Mileage | Cost per Mile | Cost of Gasoline per Mile | Cost of Oil per Mile |
|----------------------------|--------|--------|---------------|-------|----------|-------|-------|---------------|--------------|------------------|--------------|------------------------------------|---------------|---------------|---------------------------|----------------------|
| Avg. per Month of 1st Year | 112.57 | 29.75  | 184           | 38.59 | 19       | 15.76 | 46.10 | 30.91         | 273.67       | 26               | 10.86        | 503 3/4                            | 19.43         | .5636         | .0767                     | .0309                |
| Avg. per Month of 2d Year  | 110.75 | 30.08  | 163           | 32.70 | 19       | 5.80  | 43.65 | 34.26         | 257.22       | 23               | 11.14        | 436 2-3                            | 18.91         | .5895         | .0749                     | .0133                |
| Avg. per Month of 3d Year  | 120.11 | 38.69  | 164           | 31.27 | 22       | 6.43  | 36.27 | 68.59         | 301.36       | 25               | 11.97        | 436 1/2                            | 17.34         | .6905         | .0716                     | .0147                |
| Avg. per Month for 3 Years | 114.48 | 32.84  | 170 1-3       | 34.19 | 20       | 9.33  | 42.01 | 44.58         | 277.42       | 24 2-3           | 11.32        | 459                                | 18.56         | .6145         | .0744                     | .0196                |

Interest at 6 per cent. Insurance 8 per cent. Depreciation 12 1/2 per cent. per annum.

**TABLE NO. 2**  
**Expense Sheet of Hewitt 5-Ton Motor Truck Used to Freight Ice,**  
**Rockdale Ice Co., Tarrytown, New York**

|            | Months of June, July, August and September. |              |                |                     |               |                                 |                  |           |                   |
|------------|---------------------------------------------|--------------|----------------|---------------------|---------------|---------------------------------|------------------|-----------|-------------------|
|            | Tons Carried per month                      | Tons per day | Days per month | Labor month and day | Tires per day | Depreciation Interest Insurance | Total daily cost | Ton miles | Cost per ton mile |
| June ..... | 389.9                                       | 14.01        | 26             | \$78.3              | \$3.60        | \$2.46<br>.78<br>.33<br>\$3.57  | \$12.97          | 117       | .127              |
| July ..... | 510.25                                      | 21.25        | 24             | 72.3                | 3.60          | 3.57                            | 13.31            | 138       | .102              |
| Aug. ....  | 559.45                                      | 21.01        | 26             | 78.3                | 3.60          | 3.57                            | 13.42            | 145       | .097              |
| Sept. .... | 495.7                                       | 12.02        | 26             | 78.3                | 3.60          | 3.57                            | 13.27            | 137       | .103              |

Tire cost is figured by taking the price of a set of tires, \$540 and dividing by the number of days in service in six months—their approximate life. This makes the figure high as the tires usually last longer.

Depreciation 20 per cent. per annum; Interest, 5 per cent.; Insurance, \$100 cost of yearly overhauling, \$300, or on the basis of 300 days in service, \$1 per day.

Speed, 7 miles per hour; average load, 5 11-20 tons of ice.

**TABLE NO. 3**  
**Cost of Doing Same Work as Table No. 2 by Horses and Wagons**

|            | Teams Needed | Feed per day | Shoeing per day | Repairs and Vet. | Labor Month and Day. | Depreciation Interest | Total per wagon per day | Ton Miles | Cost per ton Mile. |
|------------|--------------|--------------|-----------------|------------------|----------------------|-----------------------|-------------------------|-----------|--------------------|
| June ..... | 4-7          | \$5.87       | \$1.41          | \$1.18           | \$245.40<br>9.40     | \$12.92<br>4.88       | \$4.49                  | 25        | .18                |
| July ..... | 5-5          | 6.87         | 1.65            | 1.37             | 264.00<br>11.00      | 15.12<br>5.72         | 4.49                    | 25        | .18                |
| Aug. ....  | 5-8          | 7.25         | 1.74            | 1.45             | 301.60<br>11.60      | 15.95<br>6.03         | 4.49                    | 25        | .18                |
| Sept. .... | 5-5          | 6.87         | 1.65            | 1.37             | 264.00<br>11.00      | 15.12<br>5.72         | 4.49                    | 25        | .18                |

Feed is figured at \$1.25 per horse per day. Shoeing at \$8.00 per month per team. Cost of team, \$600; of wagon, \$450; harness, \$100. Depreciation figured at 13 per cent. Interest at 5 per cent. Average load 2 1/2 tons; speed, 3 miles per hour.

have to be disposed of at a loss, in the case of the horses or maintained during the idle months intervening between then and the following summer at a greatly increased expense, which would make the showing in favor of the motor truck much greater. The cost of storing the one motor truck would be nominal as compared with the expense of storing six wagons and seven or eight teams of horses, as in heavy work of this nature at least that many extra horses would have to be provided in order to insure regular service. The maintenance costs of this truck for the entire season are analyzed in detail in Table No. 2.

In the earlier days, a few ten ton electric trucks were built, but owing to the limitations of electric power for this purpose, the disproportionate increase in the weight of the storage battery necessary to give adequate radius of action in such a heavy unit, they were not particularly successful. This size is still listed by some makers of electric vehicles, but so far as the writer has been able to learn, they have been employed in such isolated instances that maintenance figures are unobtainable. In view of the degree of efficiency and reliability to which the gasoline driven motor truck has been developed in the past few years, it scarcely seems possible that

the electric could compete in the field of very heavy haulage, particularly as frequent recharging or extra batteries would be necessary and the speed would not be much superior to that of a horse drawn truck of half the capacity, five tons representing about the maximum load that it has been found practical to transport as a unit. This, of course, does not take into account the transportation of heavy unit loads, such as steel columns, boilers or machinery where as many as twelve to sixteen horses are employed to haul the truck.

### The Tire Problem on Heavy Trucks

When the gasoline truck was first built in ten ton sizes by the Metzger Motor Car Company, a few years ago, the tire problem appeared to be an almost insuperable obstacle to their success. Bearing in mind that the empty truck weighs 13,000 pounds, and its load 20,000 pounds, the total weight on the tires is 33,000 pounds, or 8,250 pounds per wheel. The largest single solid rubber tires ever employed were 8 inches wide. Assuming the surface of the tire in contact with the ground to measure four inches, which is approximately correct for this size, the total area would be 32 square inches. This would give a pressure of about 257 pounds to the square inch on the rubber at the point of contact when the truck is loaded. But as almost two-thirds of the entire load is borne by the rear wheels, this would make the pressure per square inch on the rubber of the rear tires increase to the prohibitive figure of 687 pounds per square inch.

Rubber is a practically incompressible material, although it is very elastic, which is erroneously regarded as the same thing. Due to this elasticity, the rubber of the tire in contact with the ground is forcibly squeezed out. In other words, it is simply displaced, owing to the terrific pressure. But as neither this, nor the remaining rubber in the tire can be compressed, it has to go somewhere. As its only escape is from the rim of the wheel altogether, it either disrupts the tire or forcibly pulls it off the wheel. Advantage was taken of the

**Comparative Costs of Hauling by Horses and by Motor Trucks**

|                          | Cost Per Day | No. Teams Carried Per Load | Daily Average No. Miles | No. Miles Loaded | No. Ton Miles | Cost Per Ton Loaded One Way Only |
|--------------------------|--------------|----------------------------|-------------------------|------------------|---------------|----------------------------------|
| 1-horse wagon and driver | \$4.00       | 1                          | 22                      | 11               | 11            | 36c                              |
| 2-horse wagon and driver | 6.00         | 3                          | 20                      | 10               | 30            | 20c                              |
| 3-horse wagon and driver | 8.00         | 5                          | 18                      | 9                | 45            | 18c                              |
| 1-ton motor truck.....   | 8.00         | 1                          | 80                      | 40               | 40            | 20c                              |
| 2-ton motor truck.....   | 10.00        | 2                          | 70                      | 35               | 70            | 14c                              |
| 3-ton motor truck.....   | 12.00        | 3                          | 60                      | 30               | 90            | 13c                              |
| 5-ton motor truck.....   | 15.00        | 5                          | 50                      | 25               | 125           | 12c                              |
| 7-ton motor truck.....   | 16.50        | 7                          | 46                      | 23               | 161           | 10 1/4c                          |
| 10-ton motor truck.....  | 18.50        | 10                         | 38                      | 19               | 190           | 9 3/4c                           |

**TABLE NO. 4**

**Approximate Daily Cost of Motor Trucks**

|                                               | 10-Ton     | 7-Ton      | 5-Ton      | 3-Ton      | 2-Ton      | 1-Ton      |
|-----------------------------------------------|------------|------------|------------|------------|------------|------------|
| Chassis cost .....                            | \$6,000    | \$5,500    | \$5,000    | \$3,000    | \$2,750    | \$1,500    |
| With stake body .....                         | 6,300      | 5,775      | 5,250      | 3,225      | 2,925      | 1,700      |
| Average miles per day .....                   | 38         | 46         | 50         | 60         | 70         | 80         |
|                                               | Per Year   | Per Year   | Per Year   | Per Year   | Per Year   | Per Year   |
| Depreciation, 15%, less cost 1 set tires..... | \$780.00   | \$743.00   | \$695.00   | \$421.00   | \$390.00   | \$225.00   |
| Interest, 5% .....                            | 315.00     | 289.00     | 262.00     | 161.00     | 146.00     | 85.00      |
| Driver, \$16 to \$22 per week.....            | 1,144.00   | 1,092.00   | 1,040.00   | 936.00     | 936.00     | 832.00     |
| Garage .....                                  | 300.00     | 300.00     | 300.00     | 240.00     | 240.00     | 240.00     |
| Tires .....                                   | 1,650.00   | 1,231.00   | 930.00     | 620.00     | 480.00     | 300.00     |
| Yearly overhaul and current repairs .....     | 550.00     | 500.00     | 450.00     | 400.00     | 350.00     | 300.00     |
| Gasoline at 12c. ....                         | 450.00     | 450.00     | 450.00     | 375.00     | 325.00     | 275.00     |
| Oil at 30c .....                              | 120.00     | 100.00     | 90.00      | 60.00      | 50.00      | 40.00      |
| Insurance .....                               | 220.00     | 210.00     | 200.00     | 150.00     | 140.00     | 125.00     |
| Cost per year .....                           | \$5,520.00 | \$4,915.00 | \$4,417.00 | \$3,363.00 | \$3,057.00 | \$2,422.00 |
| Cost per day .....                            | 18.43      | 16.38      | 14.72      | 11.21      | 10.19      | 8.07       |

Compiled from the records of Hewitt Trucks over a period of five years. Copyright 1911, Metzger Motor Car Company.

fact that rubber will yield by displacement in employing two tires on the same wheel. This is the commonly known dual type, but it has not proven entirely practical where the weight per wheel exceeds 5,000 pounds, due to the fact that the space between the tires allowed for lateral displacement of the rubber is not sufficient to take care of the great pressure to which it is subjected. The solution of the problem was finally found by allowing for both lateral and longitudinal displacement, this taking the form of the Kelly-Springfield block tire, the units or blocks of rubber being held by a steel plate retainer instead of the usual rim, and being so spaced that the displacement of the rubber would be taken care of by the intervals between them.

### Some Maintenance Figures on Coal Trucks

With these tires, the Hewitt ten ton trucks have proved unusually successful, and are being employed to a constantly increasing extent for the transportation of coal and similar heavy materials that can be handled in bulk. As an instance of this, it may be mentioned that a set of Kelly-Springfield block tires on a Hewitt ten ton truck lasted  $7\frac{1}{2}$  months in the service of Burns Brothers, New York coal dealers. But as, during this period the truck was used night and day for two months, it represents the equivalent of nine months ordinary service. During this time the truck made an average of  $8\frac{7}{8}$  trips per day, delivering 93 tons of coal and running 32 1-3 miles; the consumption of gasoline was 13 1-3 gallons, being a little less than 3 miles to the gallon; lubricating oil  $1\frac{1}{4}$  gallons per day. The cost of operation was as follows: Garaging at \$35 per month, \$1.17 per day; depreciation and interest, \$6.17 per day; gasoline \$1.95; lubricant .56; driver \$3.39; set aside for tires and repairs, \$5.00, making a total daily cost of \$18.24, or an average cost for delivery of between 19 and 20 cents per ton, the usual trip being about 2 miles from the yard. The high figure for depreciation is ac-

counted for by the fact that during the winter rush season, the trucks are employed practically 24 hours a day, delivering as much as 60 to 70 tons of coal during the night. The saving over horse delivery in summer amounted to 30 per cent., and in winter to about 50 per cent., the latter figure, however, not fully taking into account the delays and accidents to the horses occasioned by icy and snow-encumbered pavements in winter. From the figures given in one account, it appears that one of the Hewitt ten ton trucks in this service had not missed a load in four months' constant running. In fact, their success has been such that an order for ten Hewitt ten ton trucks—undoubtedly a record in the commercial car field in this country—was placed with the makers some time ago, and a number of these huge trucks have been in daily operation in New York City during the past winter.

As a further comparison between the cost of transportation by horses and wagons and by motor trucks, Table No. 3 will be of interest, and the same holds true of the approximate daily cost of motor trucks shown by Table No. 4. Both of these tables have been compiled by the Metzger Motor Car Company, builders of the Hewitt trucks, as the result of five years' experience with sizes ranging from one to ten tons. To all intents and purposes these figures are as accurate as they can be made, being based on actual service and not mere estimates, but they are termed approximate in view of the fact that the operating costs of two trucks of the same type and size built at the same time will differ slightly. There is also the personal element to be taken into consideration, as a skillful driver will handle his car to better effect and do more work at less expense than one who has not had the same experience, or the same knack of getting work out of the machine to the best advantage. A study of these figures throws considerable light on the reasons for the success of the heavy motor truck and the rapidity with which it is now being adopted in various lines of service.

## Commercial Car Service Departments, Their Work and What They Mean to the User

By E. S. FOLJAMBE

It has been the history of the automobile business that the dealer whose sole thought was to dispose of as many cars as possible, letting the luckless purchaser take care of himself after he had paid his money, has usually made a failure. What was true in this respect, with pleasure cars, is doubly true at the present time in regard to commercial cars. The dealer who does not realize, that after the sale is made, is in reality the beginning, not the end, is sure to come to grief in a short time. As with typewriters and many other pieces of mechanism, the customer must be continually cared for after the sale has been made and this is more true at the present stage of the commercial car industry than in almost any other line.

Realizing the all importance of properly caring for, instructing the owner and generally looking after the cars after they are in the hands of the user, has led several of the most successful manufacturers to institute what are known as

"Service Departments," whose sole business it is to follow up the work and one might say, the trials and tribulations of each car after it has become the property of the merchant.

### Autocar Service System

The Autocar Company, of Ardmore, Pa., well known makers of medium sized commercial cars, have established three such service departments, one in Philadelphia, one in New York and one in Boston. Each of these branches occupies a building of its own fitted with complete garaging facilities and, one might say, sufficient outfit for almost rebuilding an entire car. A complete stock of parts is carried at all times and competent men are in charge for the sole purpose of caring for autocars which are in the hands of the user.

The duty of these departments is to follow up by means of a corps of inspectors the various cars in use in the vicinity; to maintain a suitable garage where for reasonable prices the trucks can be overhauled, repaired or parts replaced and per-



haps most important, to provide a relief service by means of which at any time during the day or night, a user who has become stalled on the road can be immediately relieved.

### Customers Urged to Garage Cars at Service Stations

Although owners keep their cars in their own garages or

hurries to the assistance of the disabled car and as expeditiously as possible, has it on its way again. If through a collision or other accident, the machine is found to be incapable of delivering its load, another truck is immediately dispatched to the scene, the load transferred and the driver sent on his way in railroad time.

### School for Drivers

The service buildings also carry on a school for the instruction of drivers. These schools being divided into two sections, one for driving, the other for instruction in mechanism. On the road, the operators are taught how to shift gears, apply the brakes and handle the machine in traffic. In the other department, parts of the cars and a stripped sectioned chassis are employed, a lecturer showing the men in as practical a way as possible, the various points of construction. In Philadelphia this work is carried on during the day, as there seems to be no objection to the men taking this time, but in New York and Boston evening schools are also maintained as there are so many users who cannot spare the men during the day.

### Sampson Service Building, Philadelphia

The Alden-Sampson Mfg. Co., Philadelphia division of U. S. Motors Company, have recently established at 1158 South Juniper street, a service building which it is intended shall be worked out as a model and ultimately be duplicated in every important center where Sampson trucks are sold. This building contains three floors. On the first is the gar-



**Autocar Co.'s Service Depot,  
23d and Market Sts., Philadelphia**  
Two Floors have Entrance  
from Street.

at public garages they are urged to keep them at the service garage where they can be given more personal attention than when housed at other places. Owing to the large stock of parts, the complete equipment and the experienced help long familiar with this particular type of machine, better and more rapid repair work can be done. However, if the inspectors report that cars need immediate attention, men are often sent to the owner's garage to care for the machine. Charges are made for this service with, of course, an exception when any part of the mechanism proves faulty or defective. It is not unusual for the inspectors to recommend a change of drivers as it is often found that the cars are being run in a careless, slovenly manner without oil and in other ways abused.

### Maintenance and Repair Wagons

At each of the branches, special cars are fitted as "Maintenance and Repair" wagons and are held in readiness to immediately go on the road to the assistance of any truck in difficulty. These cars are completely equipped with cupboards inside similarly arranged to stock bins, in fact, complete parts are carried, such as axles, transmission gears, spring clips, bolts, extra leaves, gears, crank shafts and other engine parts. On the tail board, a heavy vice is permanently attached and on the side of the car near the rear is a bracket for a light which will illuminate the improvised work bench. Cushions and all sorts of small tools, jacks, rope, etc., are also carried.

When called, day or night, this machine immediately



**Autocar Service Depot, Beacon St.,  
Boston, Mass.**



**Autocar Service Depot, Nos. 428 and 430 W. 19th  
St., New York.**

age, stockroom and offices; and on the second and third storage rooms and shops. A large elevator is fitted, capable of handling the largest trucks and every facility for quickly repairing these machines, is provided.



Philadelphia Service Station, Alden Sampson Mfg. Co.

This department is being worked out by the branch manager at Philadelphia, and one of the features of the service department is the fact that all the men connected with it have a business origin, none of them being ex-chauffeurs or men connected with the "Automobile Game" as it has often been called. Business is the keynote of the entire establishment and the free and easy life of the pleasure car driver finds no place in this latest branch of the commercial car industry, "The Service Department." Some of the men had very little knowledge of commercial cars at the beginning but were instructed in the manner that was desired and it is claimed much more progress was made than would have been the case with men who had to unlearn much that they had previously acquired.

Aside from garaging and repairing cars and inspecting them periodically a method of quick service on the road is also maintained. On the dash of each Sampson truck is a decalcomania which reads, "If you can't fix it, call Sampson Service, Walnut 4503, we do the rest." If at any time a driver has trouble on the road, by calling up the Service Department, a specially equipped wagon with crew of mechanics is immediately dispatched to his assistance and the car fixed as soon as possible. If found necessary, another truck is sent and the load shifted, to be delivered by its original driver, while the disabled machine is taken care of by the repair wagon.

Most of the work of the service department in the garage and repair shop is of course at night, the machines usually reporting in and remaining until morning. During this time they are washed, polished and lamps and tanks filled or repaired if necessary. A very accurate record is kept of

the condition of the car, what is done to it, the oil and gasoline used, etc. This record is kept on a daily Inspection Card. Duplicates of these cards are mailed to the owner each month, so that he can check up the record of the amount of oil, gasoline and cost of repairs or replacements during the

|                                                                                   |                                        |
|-----------------------------------------------------------------------------------|----------------------------------------|
| <b>Sampson Service</b>                                                            |                                        |
| United Motor Philadelphia Co.                                                     |                                        |
| ALDEN SAMPSON MFG. CO. DIVISION<br>1116 SOUTH JUNIPER STREET<br>PHILADELPHIA, PA. |                                        |
| <b>DAILY INSPECTION CARD</b>                                                      |                                        |
| Owner                                                                             | <i>Henry Miller &amp; Co</i>           |
| Type                                                                              | <i>1000-7</i>                          |
| Day                                                                               | <i>Thursday</i>                        |
| Date                                                                              | <i>Mar 8</i>                           |
| Time truck reported in at night <i>6:05</i> P. M.                                 |                                        |
| <b>Condition</b>                                                                  |                                        |
| Remarks:                                                                          | <i>Chain loose on right hand side.</i> |
| Driver sign                                                                       | <i>W. Jones.</i>                       |
| Inspector sign                                                                    |                                        |
| See Repair Card No.                                                               |                                        |
| Time truck left                                                                   | <i>7:30</i> A. M.                      |
| Day                                                                               | <i>Thursday</i>                        |
| Date                                                                              | <i>Mar 9</i>                           |
| Reported out                                                                      | <i>OK</i> condition                    |
| Washed by                                                                         | <i>Van Batten</i>                      |
| Driver sign                                                                       | <i>W. Jones.</i>                       |

Sampson Daily Inspection Card.

month. This record shows the ingoing and outgoing of the machines and keeps, of course, a complete record of what is done to them in the department, so that the owner is always in a position to know how the trucks are behaving.



Autocar Service Wagon on the Road.

# Motor Truck Tire Deterioration

## HOW THE USER MAY INCREASE LIFE OF TIRES

BY WILLIAM J. JOHNSON

### PART I

Of the problems that confront the users of commercial cars today, the tire situation is one which cannot be regarded any too seriously, for upon the tire equipment depends the life of the machine in service, the length of the time the car may be depended upon to be capable and efficient and whether or not it will prove an economical venture. Truck tires, like everything else subjected to friction, wear out, they go to pieces or, as the tire maker expresses it, they deteriorate, and this process of decay, so to speak, is more rapid in some cases than in others.

There are many features that determine the life of a tire. To begin with it makes all the difference in the world if the car in service is properly tired, that is as regards carrying capacity and whether or not those tires are large enough to stand the "racket" for, in most cases, commercial car service under present conditions is nothing, if not, a racket. Then too, here again does the driver shine forth as a brilliant example, he may work to the advantage of his employer or he may act to the contrary and help increase the tire maker's receipts.

Another feature that has much to do with tires and their longevity is whether or not the car is continually loaded beyond its capacity and if the machine is overloaded the chances are that it will labor some under the load, but will not complain, but continue rather, and go on to the end until it either goes to pieces or otherwise becomes inefficient. There are many brilliant examples of indiscreet motor truck usages and it is really deplorable to see a fine piece of mechanism deteriorate simply because the owner has not sense enough to keep within the limit of the car's capabilities. In this connection the time is not far distant when truck makers will guarantee a truck to carry a certain load and if the purchaser overloads the car, why, he simply becomes the loser and, why not? There is every reason why he should.

It is a common impression among truck makers that motor truck tires of the present day are not up to requirements, however, from a broad point of view it is well within the bounds of reason to hazard the conjecture that the motor truck builder must meet the tire maker half way, which could doubtless be brought about by standardization on the part of truck makers. The car builders feel that it becomes the tire builders to take the initiative and the latter aggregation do not seem to shun the task but, rather are endeavoring through experiment and otherwise, to solve the problem. It must be borne in mind that the commercial car is not today what it is going to be in the future. The pleasure car has passed through one stage and into another and the commercial truck will do likewise, though there is little in common with the two types since they are intended for entirely divergent uses. In providing tires for commercial use the tire builder has been confronted by a different proposition from that on which he figured in building pleasure equipment, he has had his lessons to learn equally as much as has the fellow who has built the cars and eliminated one poor feature after another.

Doubtless truck tires deteriorate more rapidly than they may be reasonably expected to in the future, at which time the tire maker will have profited by the numerous little lessons he is now learning. The effort of today will bear results tomorrow, it is simply a case of bread upon the waters.

### Lack of Care One Cause of Deterioration

One of the factors that enter into the decay of motor truck tires, to an appreciable degree, is the lack of care bestowed by the owners of the equipment and the whole thing sifts down to that same problem of how well does a fellow maintain, care for and repair his equipment. As above stated, the driver has a lot to do with the situation and he knows it, and if the remark will be pardoned doubtless many of them care not a whit if the boss's tires do wear unduly and go to pieces in a short time; there's a reason. But that need hardly enter into the general subject here. Suffice it to say that the driver holds the key to the situation in the palm of his hand, and whether or not he is working for the interests of his employer or for a tire agency alters the complexion of the whole matter. It is common knowledge that oil is an enemy of rubber, the tire makers say, "keep them out of the oil." Now then, in such instances where cars are employed on a large scale and not looked after, where the floor of the garage is covered with heavy oil and grease it follows that, accepting the tire maker's advice, those tires are being badly used if allowed to rest in that muck and filth for any length of time. That is one side of the situation.

Now once again the driver. We will assume for sake of illustration that he drives a five ton gas car. The machine never ought to be operated at a speed in excess of nine or ten miles an hour, and that is sufficiently rapid for all practical purposes and in the course of a day's work is far more than a horse outfit could possibly accomplish. If there is no means on that machine to check, control or regulate the speed to a specified limit, and that chap at the wheel imagines that he is driving a racing car, then what happens? The roads may be rough, full of depressions or there may be a few loose stones here and there and he does not take the trouble to avoid them, he simply goes "at them." The whole machine is accordingly shocked and this sort of practice, allowed to proceed uninterruptedly, will soon tell a losing story for the owner of that truck. High speed is detrimental to the life of a tire, just as much as it is to the chassis itself. That's one feature of lack of care.

Again, tires are not watched closely, this is bad practice. Why let a few nuts on a rim retaining band go loose, for it means undue stress on the base of the tire. Many a tire goes at the base or sides when there is a lot of wear left in the tread. In fact it is the opinion of a well known tiremaker, that a tire when not properly cared for, affords about one third of the service that should have been obtained. This is costly for the owner of the truck. In common parlance, he must "get busy" and keep an eye open for the manner in



which his drivers care for his tires. Too much stress cannot be laid upon the fact that the man at the wheel is a salient feature of truck operation. We have seen that he is prone to undue speed and the like, now then as to careless operation of his vehicles. By way of comparison let us look to a locomotive, the point involved is pretty much the same in either case. The driver of a motor truck may be prone to slip in his clutch abruptly, apply the brakes harshly, he may clash the gears too suddenly and the wheels will spin. The drivers of the motor truck, like those of a locomotive, if allowed to spin, bring about the same result. There is undue friction applied to the tire and something must give way, a chewing, a wearing of the tread results. Obviously under such conditions tires cannot last long.

### Overloading Followed by Bad Results

Users of motor trucks must realize that a specified car is built for a given amount of work, in other words, the vehicle may be depended upon to carry up to a certain limit, when that limit has been reached in loading, "piling on more" is followed by deleterious results. A horse can do just about so much and he may stand for a small overload, but keep at it and the horse is gone, useless, broken down, inefficient and will have to be supplanted by another animal. This same holds true with the truck. The maker of a truck simply to demonstrate that the vehicle is staunch may pile on say, a 25 per cent. overload, but he does not do that every day in the week, he knows better than that. He has figured his margin of safety and has provided for a reserve in the essential components, but he knows when to stop. With the careless user it is different. It may be late in the day and there may be 500 or more pounds of merchandise at the freight house or elsewhere that he desires to get in that night, and rather than pay the driver a little for overtime, he will have the whole thing done at once. Now then, that driver is doubtless not at all anxious to work overtime if he can avoid it, and to pile on the overweight meets with his approval. But in that day's last trip, with that excess load, there may be harm done, and if the truck is badly used on one occasion, it may reasonably be expected to be in future. Then of course the tires built to withstand a certain weight per wheel go to pieces and like as not the maker of the tire is unduly censured, even though he may have taken the trouble to see that that particular user of his tires was properly informed of the limitations of his equipment and the disastrous results that would be entailed in overloading.

### Weight Distribution Essential

There is another feature of careless use of tire equipment and a middle western tire maker cites an instance of where two trucks identically the same were in service of a paint manufacturer and candy maker respectively. The candy maker was a thinking sort of a fellow and he saw to it that the load was equally distributed on his vehicle. The paint manufacturer, we are told, did not think the same and was in the habit of carrying a very heavy load at the rear end of the vehicle. The result was that the fellow who made sweet meats obtained good service out of his tires, while the paint manufacturer did not. From horse draft equipment it is well known that the equal distribution of weight was followed by better results than if the load was concentrated at one point, though it might be a bit more handy to have the load nearer the tail board. But if a commercial car is to be used suc-

cessfully and the best of service and true tire economy are desired, the user must have respect not only for the car itself, but for the tires as well.

### Truck Makers Will Insist on Load Limitation

As above stated, it appears that the time is not far distant when truck makers will insist on users not overloading their vehicles otherwise their guarantee on the machines will not hold. Now then, the tire maker is very much concerned in this particular situation for it is bad practice of truck makers when tires do not come up to expectations to refer the user to the tire agency or the manufacturers direct, if he desires an adjustment. If the truck maker can say that he will not guarantee his car beyond a certain limit so can the builder of tires, and as matters exist today, there are various forms of guarantee existent. Truck makers fight shy of tire troubles by reference of the matter to the tire builders.

### Larger Tires a Remedy

Tire manufacturers are of the opinion that builders of commercial car equipment do not properly consider the matter of tires and are prone to apply a smaller size than the service actually calls for. In all things it is well to have a margin of safety and truly so with tires. If a size larger tire can easily be carried by the vehicle at a slight additional initial cost and give greater service, is it not fully worth while? Most assuredly it is. There is the "margin of safety" and the tire equipment instead of being good for just an even five tons, is able to withstand much more. Longer life of tires may be expected under the circumstances. It is the practice of some makers of pleasure cars to use a little larger tire equipment for a given vehicle and it is claimed that in consequence there is a reduction of tire troubles. That this same end could be effected with motor truck equipment is well known.

### How the Truck Builders Feel

From a field of truck builders interviewed on the subject of tire depreciation it is evident that most of them do not feel that at the present time there is a really thoroughly satisfactory commercial car tire. That is a broad statement and tire builders will admit that the situation is perplexing and that their equipment could be better than it is. It is claimed by these makers that their product has improved materially during the past years. Granted. That is quite to be expected. One in passing judgment should hardly be harsh on the fellow who turns out the tires, he has his own troubles, but is getting rid of them. Co-operation of truck and tire manufacturers would doubtless be followed by good results. Each could help the other for there is a lot in getting together and meeting on common ground.

Tire equipment, in a sense, is a more important factor with electric than gas cars since, with the former, dependent upon a storage battery of limited capacity for a radius of reliable action, can do better work on one make of tires than on another, as has been amply demonstrated. This gives rise to the methods and processes that enter into the manufacture of solid tires, compounding is everything. Pneumatic tires for small trucks is another story which will be discussed further on.

### A Believer in Steel Tires

C. H. Martin, who in former years was affiliated with the Knox Automobile Company and is now with the R. L. Morgan Company, of Worcester, Mass., goes as far in his

statements as regards rubber tires as to say that they are not fitted for truck use as made at present and that the steel tire is the coming thing for heavy work. As he has been closely identified with the manufacture of trucks, their use, tire equipment and the like, his opinions on this very interesting subject are worth repeating here. Mr. Martin contends that the rubber tire is not a shock absorber. He makes the statement that when a truck user employs solid rubber tires he is simply assisting the tire builders and the maker of the truck must necessarily charge his customer \$1200, which goes to benefit the tire makers. While the mention of steel tires here is somewhat of a deviation from the general subject herein outlined, Mr. Martin's contentions on the subject are worthy of mention, at least. The authority quoted here points out that horse drawn vehicles in service for 30 years, in some instances, have been steel tired. The commercial car he points out is an improvement over simple horse methods and traveled over the same sort of roads that the commercial car is forced to use today. On Morgan five ton trucks steel tires have been used, he asserts, with good results and he personally used such equipment while in Porto Rico on Knox trucks in transportation service and the results, he claims, were "good." He asserts that there was not as bad an effect on the car with steel equipment as there would have been with solid rubber, there was no disastrous vibration and the vehicles traveled at the same speed as when equipped with rubber tires. Mr. Martin maintains that solid rubber, instead of being a shock absorber, magnifies the crystallization tendency. Rubber, he contends does not resist the shock, but magnifies it. The expense of solid rubber equipment on a five ton truck he estimates at \$1200 a year. In support of his theory that steel is preferable to rubber for tire equipment he points out that a number of years ago a manufacturer of a line of cheap horse buggies equipped his vehicles with rubber tires. The rubber tire at that time was just coming in for horse use and had gained materially in popularity. After adopting the rubber tire, this maker had 90 per cent. of his buggies returned to him with snapped pivots, whereas, with steel tires, the former equipment, and with the same materials, the rigs did service and there were no broken pivots. "Where speed is the element to be considered," he states, "the pneumatic tire is the logical choice up to 2½ or 3 tons load capacity. Where speed is not considered, steel tires, by all means." He is perfectly satisfied from his experience that the steel tire is the proper thing.

The service department of the Autocar Company in Philadelphia, had had extensive experience with both solid and pneumatic equipment. Good results with a marked decrease in the deterioration or depreciation of the chassis followed the use of pneumatic equipment and the average mileage was about 3,500, though as high as 5,600 miles has been attained with a single set of tires. The contention here is, that service has much to do with the use of tires and how long they will last. For some services, solid tires are preferred, in other case the pneumatic.

At the Knox Automobile Company, Springfield, Mass., good use has been made of pneumatic equipment, this generally being used on fire apparatus, which is featured by that concern. The contention here is, that a car must be made heavier if solid rubber equipment is to be employed. Good service, however, has been derived from solid equipment as well. The builders of the Hewitt have had extensive experience with all sorts of rubber tires and have gone into the

situation rather thoroughly. It depends a lot on just what the service is and the sort of tire employed. Anyone at all familiar with the sort of roads that prevail in the New York shipping district will readily appreciate that tires are used pretty hard even if a careful man is in charge of the vehicle.

The Lansden Company, at Newark, electric truck builders, cite an instance where the composition of a tire may mean a lot in battery consumption. A Lansden car was equipped with one make of tire and gave good service. A representative of another make was told that his equipment, while affording good wear, would require more current. He could not believe it. A demonstration proved the point. The contention here is that speed, among other things determines the life of the tire. The tire expense, therefore, deterioration, is squared with the speed.

Now that a few expressions from the truck makers have been noted, it is well to give the tire builders a chance. For obvious reasons no names are mentioned. It is a recognized fact that the tire makers are honestly trying to produce a tire that will meet all service conditions and afford more and better service than is to be had with present day equipment.

A middle western maker of motor truck tires states that bad features have been eliminated and the product today is vastly better than it was a year ago. This concern early took up the manufacture of truck tires and purchased a truck for freight use and also with the intention of trying out various types of tires so that two ends were accomplished. It is conceded here that present day tires are not what the company would have them, but the belief is expressed that they are as good as any that are to be had. It is admitted that one feature of construction that makes for a good or inferior equipment is the base. Various types of bases have been tried out. As to what may be had in the way of service it is pointed out here that with the company's equipment on a line of metropolitan buses as high as 14,000 miles have been attained.

Another maker was asked if tires to-day were absolutely right and the confession that they were not was most frank, but it was stated that everything was being done to bring about a more satisfactory equipment and it was expected that before very long a much better tire would be the result. Various methods of manufacture were pointed out and it was mentioned that the one feature that kept all makers on the "ragged edge," so to speak, was the base. Asked as to the feasibility of pneumatic equipment the answer was, "It would be all right if you did not find that sign, 'Deliver all goods in the rear.'" The scheme, it was pointed out, was all right for city use proper, but the having to go up the back alleys as is now demanded pretty much in all the big cities, rendered the use of the pneumatic equipment prohibitive. As to how much tires depreciated it was again pointed out that various elements enter into the proposition. It all depended on what the roads were, how the cars were cared for and who was driving them and the speed. The claim here was, that the product of the firm had improved 300 per cent. within a year. The thing in the solids, it was pointed out, was to secure them at the base.

Another maker was asked if he thought that tires were properly cared for. The response was to the effect that if the concern thought so it would not go to the expense of thousands of dollars in the issuance of a complete book of instructions together with the proper tables of inflation; the equipment here is pneumatic and featured mostly on fire apparatus where high speed is a chief requisite.



At another middle western factory the same line of questioning brought forth the response that users of tires are coming more and more to realize that if commercial car service is to be economical the user must of necessity care for his equipment, not in a haphazard manner, but thoroughly and efficiently. It was here again pointed out that the life of a tire sifts itself down to the sort of fastening or base employed and the speed. The fewer shocks that are transmitted to that base, the longer that tire is going to wear and give good service. On light trucks it was said that from the experience here gained the service had been satisfactory. Another feature of tire depreciation is the weight carried and whether or not the load carried is evenly distributed. The comparison in the manner of the loading of two identical cars in different services was here cited. Attention was called to the necessity of truck users employing larger tires. The fact that small equipment has been in use is due pretty much to the makers of trucks. The shape of a tire too, it was said, had much to do with the wearing of a tire. Makers are not yet convinced, it was said, as to which was preferable, a time or a mileage guarantee.

At another factory it was not deemed good practice to employ pneumatic tires for a one ton truck. "Ninety per cent. of the commercial cars are overloaded." In the opinion of this concern the commercial car is just born, it is an infant and the tire builders are confronted by a new situation. There is a lot to learn and much good will come of the things that are learned at this time.

The tire makers have to suffer for the lack of discretion on the part of the truck builders when they apply smaller tires than ought to be used. This maker is of the opinion that the truck makers will guarantee their product to carry only a specified weight. Fitted with tires equal to the demand for supporting that weight and exceeding the limit, the user will have to stand the cost of his own indiscretion.

Another middle western manufacturer of tires claims as high as 30,000 miles on a single set of tires. In this instance the use of pneumatic equipment is not recommended on trucks. Some makers of the cheaper trucks, it was here stated, would not apply the proper sized tires, result, rapid depreciation. Here also was the opinion expressed that vehicles are overloaded. In this case it is claimed that a special and most satisfactory compound has been determined for the use of electric vehicles where current consumption means a lot in the successful operation of the vehicle in service. From the expressions above outlined it is evident that the user of the truck has something to learn and the quicker he acquires that knowledge the better for him. Larger tires mean economy and the prospective purchaser has only to bear in mind that before making an installation, not only should he secure himself on the proper vehicle, but likewise must he make sure that the tires are right. He must also employ drivers who know their business, economy in the wages of the drivers is hardly a paying proposition in the long run.

(Part II of this article will appear next month)

### WHY A SMALL MOTOR MOVES A LARGE LOAD

Some express surprise that some trucks with comparatively small motors do such excellent work, moving fairly large loads with excellent efficiency and economy. It is the fact that the commercial car operates at low speeds that makes possible the utilization of the small motor. By the use of the proper gearing, giving a large reduction, the power at the rear wheels is so increased that a small motor carries a large load. Of course, this increase in power is attended with a loss in speed. Another thing which has done much to make possible the small motor for truck service is the development of what may fairly be called a science of bearings, which has developed various types of bearings for various positions, so that power is transmitted with the least frictional losses.

A fairly complete list shows that the power of the average truck is under thirty h. p., while the average capacity is slightly under three tons. This is at the rate of 200 lbs. per h. p., and since most commercial cars weigh about the same as their rated capacity, each motor h. p. moves 400 lbs. This is a load greatly in excess of that moved by the pleasure car motor, but when we remember that the pleasure car motor moves its load at the rate of 50 or 60 miles per hour, while the truck seldom reaches 12 miles per hour, the way more power is obtained by lessing speed through increasing the number of turns of the engine to one of the rear wheels is strikingly shown.

### PITTSBURG TO HAVE MOTOR-DRIVEN SPECIAL DELIVERY SERVICE

The Motor Service Company, located at Liberty and Third avenues, Pittsburg, Pa., has recently opened for business and has given Pittsburg merchants in the down-town section who have not a commercial car delivery service of their own, a chance to have their parcels and bundles delivered in quick time, to the residential and suburban districts.

This company has placed in service ten large Chase trucks and several small three-wheel motor-driven special delivery parcel cars. Daily delivery routes have been laid out in all directions from down-town Pittsburg to the different residential sections. One truck, called the "pick-up car," is canvassing the down-town district all day, bringing in parcels to the central distributing station, where the packages are given their proper routes and placed on the trucks going to the respective suburbs.

Four to five deliveries per day are made in the down-town and East End districts, while two deliveries per day are made to the nearer suburbs and one delivery to the more distant towns.

THE ENDURANCE AUTOIL COMPANY, is the new title of the Harris Oil Company, of Muncie, Ind., and hereafter this concern's oils and greases will be marketed under the trade names, "Endurance Autoil" and "Endurance Greases."





## Satisfactory Commercial Car Service Dependent Upon a Thorough System of Maintenance

SOME INTERESTING METROPOLITAN EXAMPLES OF HOW IT IS DONE

BY WILLIAM J. JOHNSON

Satisfactory, efficient and consistent commercial car service depends to a great extent upon the care and maintenance of the vehicles in use. An installation is hardly consistent when the cars in use are not properly looked after, repairs must be made when necessary, not to-morrow, the day after or a week hence. "A stitch in time saves nine," the old saying, has it and rightly so, it is the fellow who makes repairs as soon as needed that gets there and back and is ready for busi-

ness the next morning. Satisfactory, efficient and consistent commercial car service depends to a great extent upon the care and maintenance of the vehicles in use. An installation is hardly consistent when the cars in use are not properly looked after, repairs must be made when necessary, not to-morrow, the day after or a week hence. "A stitch in time saves nine," the old saying, has it and rightly so, it is the fellow who makes repairs as soon as needed that gets there and back and is ready for busi-

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Garage of the New York Edison Company.

ness the next morning. There are various methods in vogue of caring for cars, both gas and electric, some are excellent, others are fair and others still are not deserving of mention and the wonder is that these cars operate at all. It is well understood that some who have installed power business vehicles have become disgusted in a short time, simply for the reason that the same care given horses was not accorded the commercial tractors, these being machines—inanimate, it was assumed that they could stand anything. What a fallacy! The whole thing in a nut shell is a lack of "common sense." To a close student of commercial car service, the methods resorted to by some and called "system" are nothing short of farcical. It is not, however, the intention here to criticise, but merely to point out.

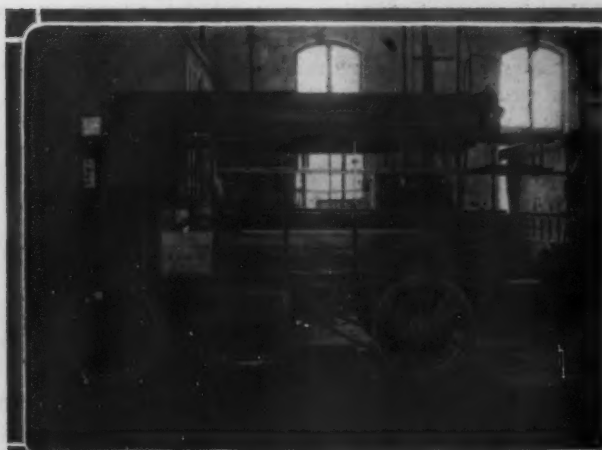
Now then, it is also a well established fact that where installations have been consistent, where a thorough system

rived is so far in advance of that previously accomplished with horses that the firm could not if they would, return to the methods of the old days without loss of business. There are still horses used in this identical service, but many have been disposed of and the rest are slated to go very shortly. One truck does the work of five horses. So, why shouldn't that concern put into operation more trucks and do away with horses? The writer spent several days tramping about New York City observing commercial cars in service, the methods of care employed, etc. In every instance where good service was the answer, there was an effective system of repairs, care and maintenance. Some of these cases are cited in the following text:

New York has long been regarded as the American motor mart and surely there is no city on the American Continent where perhaps a more severe class of conditions have to be

met. And it is right here in New York that some of the very best systems of care and maintenance are in operation. The fellow who has looked into the matter, considered it from every angle and finally installed cars, does so, because he is convinced or at least has the idea that his delivery service is to be bettered. By the exercise of a little more common sense he knows that as a matter of business his vehicles cannot be laid up half the time and net him a profit. So, he works up a system, and puts it into practice. Of necessity he must do so, for, inasmuch as one power vehicle is equivalent to two

arriving in the morning the operators of the various cars have their time stamped on a card and are given day cards on which are cited stops of the day. As each car leaves the garage, the number of the vehicle and the time are noted. In the event of a breakdown, or an accident, the operator notifies the main office and fills out an accident blank. When a vehicle comes in at night at the completion of the day's work, the time of arrival and the number of the car are taken. Then the day card is turned in. The operator then records his daily mileage, he cites the condition of the machine and



**Battery Being Lowered  
by Special Lift.**

or more horses, there is that much more of a loss every time a car is out of commission. The thing is, to "keep them going." We will now show how some of them do it.

### The New York Edison Company

Doubtless one of the best examples of commercial car service in the city of New York is the New York Edison Company, an organization generating and marketing electric current. It is not surprising that the New York Edison Company should use electric vehicles, hardly anything else would be expected of them. It was in 1901 that the first two electric vehicles were introduced in the Edison service and it was not long before those cars demonstrated the many advantages peculiar to self-propelled vehicles. At this writing there are 72 electric cars in the service of the company. The system in vogue by them is interesting. Obviously a concern of the proportions of the New York Edison Company, with a vast amount of work to be done, must expedite matters with all possible despatch. The main garage of the company is located at the foot of East Forty-first street, near the East River, and there is every facility for the care of the cars in service. On



**Battery Ready for  
Overhauling.**

signs his name to his report. Assume for example, that the armature needs attention, a steering lever has a little unnecessary play, or a brake rod may need adjusting, the fact is noted and the repairmen then take the car in charge and the necessary work is done and it is ready for service in the morning. If, on the contrary, extensive overhauling may be necessary, the car is sub-

stituted by another or emergency vehicle. Thus it is plain that an accurate record of the machine for the day is kept, and when the car is put on charge readings are taken frequently. All vehicle batteries are numbered, the mileage recorded and totalled monthly. Likewise is the travel of the machines recorded. A brass tag bearing the company's name is put on each wheel and the date noted by means of which the mileage of the tires is recorded. When the tires are worn out the numbers corresponding are destroyed and when the new tires are applied so are new numbers placed on the wheels. Each car in the service of the New York Edison Company is overhauled once every year and 71 machines kept in constant service. Ten surreys, two landaulets and one roadster are used by officials of the company in the discharge of the day's business, the average being 40 miles on one battery charge. Eighteen 1000-pound wagons are used for the



**Method of Removing Battery from Truck.**

delivery of incandescent lamps to the various consumers of the Edison Company, one is used to respond to all emergency calls to burn-outs. The average performance of this class is 30 miles on a single battery charge. Twenty-three 2000-pound wagons are used by the arc lamp and meter department and for the general delivery of material to and from the stations of the company, the average of this fleet being 35 miles on a single charge. One 2½-ton and two 3-ton trucks are used for hanging electric signs and street arc lights. The day's work is between 20 to 25 miles on a single charge. For

being of brick with ornamental trimmings and of general fireproof construction. There are two floors, cars being stored on both first and second stories. This firm is comparatively new to New York and started operations without horses, using commercial cars entirely. There are 66 Studebaker cars in service, ranging from 1000-pound delivery wagons to 7000-pound trucks; 12 Lansden electric wagons, from 1000 to 2000 pounds load capacity, are employed, and five Autocars of 3000 pounds load capacity are used. For the heavier work five 7000-pound Alco trucks are in service. The building is well



Interior Gimbel  
Garage.



Emergency Wagon  
Checking Out.

the heavier and more strenuous demands of the company's service, five 5-ton trucks are employed, these being utilized for pulling and hauling cable and for general trucking. The average is 15 miles on one charge.

### Caring for the Cars

Ostensibly there must be a system to care for these cars. The Forty-first street garage of the Edison Company is a brick structure, one story in height, the roof being of good height. The building is divided into two sections by a brick wall, entrance from one room to the other being through a large door. Cars are stored in the outer room and the battery and repair work is done in the inner room. There is a machine shop fully equipped and every car in the garage may be charged at the same time. Charging plugs with extension cables are distributed at convenient intervals. All minor repairs are made during the night, and, as above stated, should a car for any reason require a more extensive treatment another takes its place. A force of competent men in charge of a superintendent looks after the cars. The work accomplished here is doubtless representative of the best present day practice.

### Gimbel Bros.' Modern Garage

One of the more modern garages in New York is that of Gimbel Brothers at No. 513 West Twenty-fourth street, this



Workshop in Gimbel Bros.' Garage.

laid out and there is ample room for all the cars in service. On the first floor at the east end is the office of the garage superintendent, who has two men to look after the records of the cars and, here again is another instance of where the cost to a "penny" is known. All repairs done on a given car are charged up to that vehicle, all tire expense, fuel expense and the like are also noted.

There are four large doors leading to the main floor, at the west end of the building there is a freight elevator for raising cars to the second story level. Midway of the south side of the building is a fireproof room in which is located the charging apparatus. Every electric in the possession of the firm may be charged at one time, there being charging plugs and cables conveniently placed throughout the building in connection with which there is an annunciator system by means of which it is known when a battery has been fully charged. There are overhead washers conveniently placed. The second floor of the building, like the first, is of fireproof construction. At the east end, and fully enclosed, is the battery repair department, where all the company's battery work is attended to. There are charging plugs and cables on the second floor, as well as on the main floor, and there is also a large switchboard for the use of the battery department with twelve charging and two discharging circuits. The machine shop is located on the second floor,



this being well lighted and partitioned off by heavy wire screens which rather adds to the lighting effect. The repair work, of a mechanical order, is executed by the force at work here. There is also a paint shop, which is 25x35 feet. There is also a blacksmith shop, this being at the east end of the building on the roof. Drivers have to sign themselves out in beginning the day's work, and a record is kept of the doings

which enables the Wanamaker three ton trucks to accomplish prodigious tasks without loss of time.

This loading nest is nothing more or less than a frame work slightly smaller than the inside of the truck body proper, resting on roller bearings in two permanent channels or grooves in the floor of the truck body proper. The nest, when loaded, is simply pushed into the vehicle as shown in the ac-



Pushing the Loaded Nest into the Truck.

of each man and his car. When a vehicle returns in the evening it is inspected and minor repairs are made during the night. In this way there is no interruption in the service and the cars are ready for the road the next day.

### The Wanamaker Loading Nest

Some one once said that "Necessity is the mother of invention" and the truth of that saying has been borne out times too numerous to mention. It was a case of necessity that resulted in the development of the loading nest used by the firm of John Wanamaker, one of the best devices for quick loading that has yet been evolved. Insurance people are naturally very fussy as regards the operation of gasoline trucks about large buildings, and they did not take kindly to the idea of having the Wanamaker three ton trucks go into the big Wanamaker store. The result was, that two people got their heads together and evolved the loading nest,

completing illustration and the driver proceeds to some one of the outlying Wanamaker distributing stations; here the nest is removed and the contents passed out to other vehicles for delivery, and on the return trip to the Wanamaker store the truck brings back an empty nest. Down in the sub-basement of the Wanamaker store all is life and bustle. Bundles and packages for outside destinations are packed in these loading nests, and the work is so done that when the truck reaches its destination and discharges the nest the routers at the outside stations simply divide the load according to the routes of suburban delivery. When these nests are filled they are brought to the street level on the elevator, each resting on a four wheel hand truck, as shown in the illustration, and the nest being on roller bearings slides freely into the truck. This nest being on roller bearings slides freely into the truck. This has been found to work out very well and is now being featured by the builders of the Packard truck.



First and Second Floors of Sloan Garage. White Truck Just Leaving Elevator.



### Repairs Made During the Day

A modern garage in which all work is done by the firm's own force is maintained by W. & J. Sloane, at No. 541 West Twenty-ninth street. It is of neat design, two stories of brick, with basement and houses the fifteen White gas vehicles and the three electric trucks used in the Sloane service. Charging plugs are provided for the electrics. A 24-foot elevator is used to raise the cars to the second floor, where part of the fleet is stored. As a record is kept of each individual vehicle, the firm know just what the cost is for various items of expense. The repair work is done by the superintendent of the garage and his assistants, and when a car is laid up, the driver works upon the machine as an assistant. Here, however, there is a departure in that the cars are not repaired at night and such work as has to be done is executed in the daytime. The machines are inspected regularly, and if much overhauling is required that particular vehicle is withdrawn from service and does not go back again until all work is completed. Overhead vehicle washers are conveniently placed. This firm has had considerable experience with commercial cars, and at present delivers merchandise within 100 miles of New York. The trucks are on the go practically all the time so that a thorough system is necessary to look after them.

### Mammoth American Express Co. Garage

The size of a garage is necessarily in conformity with the demands to be made upon the structure. One of the largest garages in this country is that of the American Express Company, at No. 219 East Forty-third street, a modern, seven-story, fireproof structure, fully equipped for the care and maintenance of the company's commercial cars, and the methods here are obviously along a more pretentious scale than any cited in the foregoing text. The building has been so designed that there is ample opportunity for future expansion. Of the various floors of the building doubtless the seventh, or top floor, is the most interesting, as here is executed the real care of the cars in service. The other floors serve principally for storage purposes. The express company has in service twenty-three Alco three ton trucks, three General Vehicle electrics and two Baker electrics; the electrics being 1000 pounds, two and three ton types. The garage also houses seventy-eight taxicabs of Thomas and Alco make. This mammoth building runs through for a solid block and therefore fronts also on

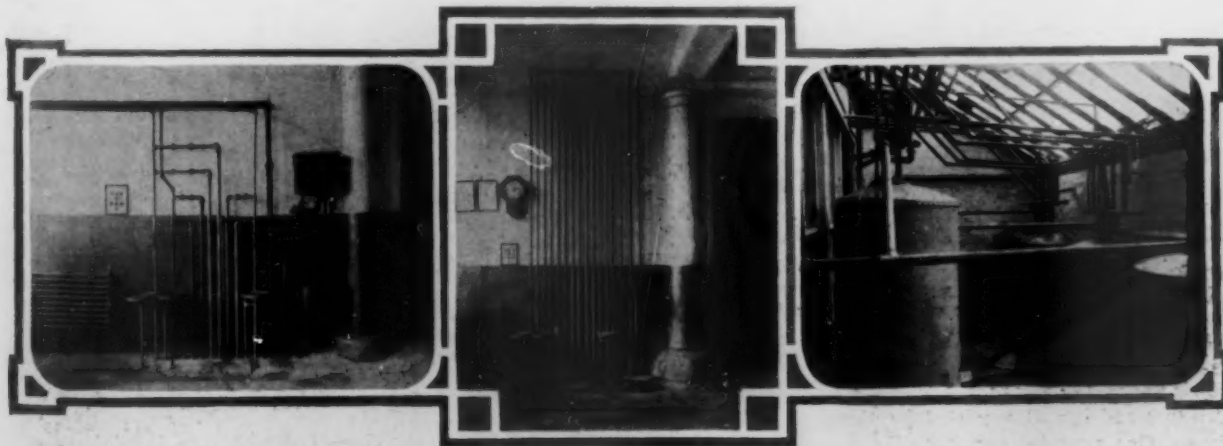
East Forty-fourth street. As above stated, all repairing is done on the top floor, where there is a fully equipped machine shop and a large force of men to do the work. When a car needs attention it is consigned to the repair department, a large elevator being in service to raise the car's from the street level to any one of the six floors above. All stock is passed out on a requisition. The cars can be washed on either of the floors and the floors are so sloped that the water will drain off to side gutters. Perhaps one of the most novel features of the system in vogue here is the delivery of lubricant and fuel. The hydraulic system is used and the pipe lines extend to the top floor of the building so that it is a simple matter to charge the cars in the repair department when it is desired to send them out again in service. A record of all work is kept by an office force, and the proposition has been so systematized that the cost of virtually everything that is done about a car is figured to a nicety. With a large fleet of machines on the "go" continuously, it follows that the system must be up to the minute.

### The Adams Express Garage

The Adams Express Company garage on West 47th street is a four story brick structure with basement, but unlike others is used for horse purposes also. The first floor of the building is utilized as a distributng department, horse stables being on the second floor. The third floor is used as a paint shop while the fourth floor is given up for the repair department, there being a good equipment to turn out the necessary work. A general superintendent, who also has the horse equipment under supervision, has matters in hand, and he is assisted by a general foreman. The fleet here consists of three ton Packards, and some of the earlier cars of this make, as well as Alco gas trucks and Lansden electrics. General Vehicle electrics are also used. The machine and repair department on the top floor executes the work required, and a record is kept of everything that is done about a car. The system in vogue is substantially that of contemporary users of commercial vehicles.

### Erecting a New Garage

It is a well known fact that the mechanical equipment of a modern brewery is up to the minute and a live, hustling, concern would naturally be expected to do things right when



Fuel Delivery and Storage System, American Express Company Garage, New York City



it is a question of commercial car care and maintenance. Of the New York breweries, the service of Peter Doelger can doubtless be regarded as typical of the best practice, not that it is lavish but, rather, consistent. This firm, as quoted in the beginning of this article, have expressed the opinion to the writer that they would not

return to horses. The concern has now well along towards completion a modern two-story garage on East Fifty-sixth street, this being of Philadelphia brick front, with granite trimmings, and cream brick sides and rear. At present the firm is using seven General Vehicle electric trucks, all these being of five tons load capacity. In this new building everything is to be driven by electricity, the firm make their own current, and have installed the best equipment to be had for charging purposes. Nothing is done outside the company's premises that can be done within, an expert is in charge of the battery equipment, and he is ably assisted, and, with everything to work with, it is up to him to produce results, and, according to the report of members of the firm, he "makes good." So well pleased is this concern with the work of its commercial equipment that an enlargement of the service is contemplated for the near future. The new garage is so designed that two or four additional stories can be added without the slightest difficulty, so there is every chance for future expansion. In the opinion of the firm, one five ton truck will do the work of five horses. By doing all their repair work on their own premises they are gratified with the results obtained.

### GAS AND ELECTRIC BEEF TRUCKS

Within a stone's throw of the Doelger Brewery is the United Dressed Beef Company, who are using both gas and electric cars, and do their own repair work. The garage and stable is a commodious structure and is well appointed for the work to be done. One 1,000 lb., two 8,000 lb. and two 7,000 Mack gas trucks are in service here and 14 General



Piercy Contracting Co.'s Garage.  
Corner Main Floor.

Vehicle electrics, two of these being 10,000 pounds load capacity, one 3,000 pounds and the balance 7,000 pounds load capacity. The gas cars average 250 miles a week and the electrics 130 miles a week. The company makes its own current, which is led through a conduit from the engine room in the building near the East River to the garage further up the street. All the electrics can be charged at one time if necessary, and enough current is available for the charging of 18 electrics at one time. All truck repair work is done by the company's own men on the first floor of the building. In this instance the installation of commercial cars has broadened the sphere

of the concern materially. Before the trucks were put in service everything was shipped on the cars. Now, it is all done with the power vehicles. Trips are made to White Plains, Dobbs Ferry, Tarrytown, Far Rockaway and Summit, N. J., as well as to other points throughout Manhattan. The electrics are used for the city work and the gas trucks for the outside service. Recently, it is claimed, one of the Mack vehicles made two trips and return from Far Rockaway, which is a total of 120 miles in one day. The concern has been somewhat fortunate in the selection of drivers. Chauffeurs in the ordinary acceptance of the term, were not employed, rather, as each new car was received some one of the "teamsters" was designated to operate the vehicle and was

accordingly "broken" in. These men understand the needs of the concern by whom they are employed, and it is claimed that there has been necessity for but little repairing in consequence. One of the best drivers in the service, by the way, is a man over 60, who for years was a teamster and had had no previous experience when he was assigned to a Mack truck, the first machine installed. He knows how to use the car, hence a minimum of repairs.

### What Mechanic and Helper Accomplish

An interesting and novel installation is that of the Curtiss-Blaisdell coal concern, which has coal pockets distributed throughout Manhattan. The equipment embraces four couple gear vehicles, one 6½ tons, one 7¼ tons, one 8 tons and one



Switchboard,  
Piercy Garage



of 9 tons capacity, a 5 ton Morgan gas truck and a General Vehicle 5 ton electric. The cars are stored in a low one-story structure that is anything but pretentious, and a man of long experience with both gas and electric cars is in charge. He has one assistant and the two men keep the cars in trim for the hard service which they are called upon to meet. The 5 ton electric truck is stored and charged and otherwise looked after at the rate of \$60 a month at a public garage. This truck has to be boosted two hours during the middle of the day. The couple gear equipment is somewhat novel, the four wheels of the chassis proper being used in the steering, while behind, as a trailer, is a regulation coal wagon body which is secured to the small couple gear chassis forward and being permitted to turn as the direction of the travel around corners may necessitate. These trucks are kept on the move, and two men do the work. Good results are claimed. The latest couple gear acquisition will average close to 1,600 tons a month delivery while the smaller vehicles of the same type are good for about 1,200 tons per month delivery, thus it is plain that they are working hard.

### Consistent Electric Installation

One of the most interesting of the metropolitan installations is that of the large contracting firm of H. C. & A. I. Piercy, at No. 422 West 15th street. Here are installed 40 Studebaker electric cars, 29 of these being 850 pounds load capacity, 3 of 1,500, 3 of 2,500, 2 of 7,500 and 3 of 10,000 pounds load capacity. These cars are all rented out to patrons of the firm at a flat fixed rate. Uniformed chauffeurs are provided for the vehicles, and the patrons of the service assume no liability in case of accident. The contracting firm assumes all liability and guarantees the safe delivery of merchandise and to keep the car in operation at such times as it is wanted. If a vehicle should break down the driver has only to notify the office and another car is despatched at once and the load transferred so that there is very little loss of time under such circumstances.

### Garaging

There are three floors given up to the electrics at the Piercy establishment, the first, fourth and fifth. The heavier cars are charged on the main floor, the current here flowing at 110 volts with charging plugs placed in a handy position on the walls. The lighter cars are charged on the upper floors, the voltage being 70. The average mileage of each car is 30 miles a day. There are two elevators in the building and each floor is 50x100 feet. A separate battery department with all facilities for executing work is maintained, this being 40x40 and this, as well as the other floors, is heated to a temperature of 70 degrees. The heating plant in the basement pro-

vides hot water for the use of the battery department. A full stock of parts is carried so that in case of a breakdown replacement of part broken will require the shortest possible time. There is a machine shop, and here are to be had various tools needed for such work. On the upper floor there is a charging station, the current coming into the building at 220 volts and being transformed to meet the needs of the charging lines. All circuits come to a central point and each charging line is controlled by a separate switch.

Then, too, there is a paint shop where the bodies of Piercy cars are refinished. An accurate record is kept of each car. The company's contracts with its patrons guarantee 35 miles a day of uninterrupted service. The Piercy Company went into the commercial field a year ago last September and claim that for its especial field the electric vehicle best meets all demands where stops are necessarily frequent. The name of the patron is lettered on the vehicle and every effort is made to maintain each car to the best advantage of all concerned and to keep all machines in service is regarded as a matter of economy. Everything about the care of the vehicles is done on a systematic basis.

### An Economical Installation

Aitken & Son Company conduct a garage for the care of their eight electric Lansden delivery wagons on East Twenty-sixth street, and the Lansden cars used by A. A. Vantine & Company are also housed in the same building. The cars are stored, cleaned, repaired and the like in one room 23x90 feet in the front corner of which is the office, also the charging board. A foreman and one mechanic do all the work necessary on these cars. Two men work nights at polishing and washing. This installation is regarded as one of the most economical in town, there being nothing about the place that is not actually needed for the care and repair of the vehicles. Results are regarded as most satisfactory.

Quite the opposite is the Tiffany garage on East Forty-first street. The building is of beautiful design and was the work of the late Stanford White. It is fully appointed and there is every facility for the care of the cars, the treatment in general being more lavish.

There are numerous users of commercial cars in New York City who have their cars cared for at a public garage. However, this is considered by those who claim to have looked at the matter from every point of view, as not conducive to as good results as if the cars were under one's own roof. But be that as it may, many cars are cared for in the public institutions. In small installations this relieves the owners of more or less care which would otherwise result and they are doubtless glad of the opportunity to pass the matter along to some one else.



## Truck Depreciation—Some Erroneous Impressions —What It Really Amounts To

TEN PER CENT A FAIR AVERAGE UNDER FAVORABLE CONDITIONS

BY WILLIAM J. JOHNSON

### PART I

One of the first problems that confronts the prospective purchaser of a motor truck is depreciation of which he hears from one source or another and doubtless very often from the salesmen themselves. The term "depreciation" is one of the most "indeterminate" that can be applied to a commercial car for the reason that it is somewhat difficult to arrive at a true basis for computation. Depreciation might well be called a system of bookkeeping and the prospective buyer must bear in mind that the whole thing depends upon himself, his system of care and maintenance and just how well he does things in general. His car, if it be a good one, can be made to last ten years or more, or, he can wear the thing out in a year and thus have it depreciate 100 per cent. This fact cannot be impressed too strongly in the minds of those who would install motor trucks if they intend to better their present systems and do away with horses entirely. The subject is a most interesting one and cannot be regarded too seriously.

### Some Erroneous Impressions

It is a common impression among some classes of users that a motor truck depreciates from 20 to 30 per cent. a year with gasoline vehicles, and from 10 to 20 per cent. with electrics. The writer after close observance of the methods of care and repair involved in various services, and after interviewing various users of trucks arrives at the conclusion that under favorable conditions the average depreciation of both gas and electric cars does not exceed fifteen per cent., thus making the life of a car nearly ten years; in fact, it is generally conceded that ten years is a fair life of a motor truck, "properly maintained." In connection with this point it might be well to state that one manufacturer says that he has never yet seen a car actually wear out in service, so that it had to be scrapped and could not be restored to a state of usefulness. Then again it should be remembered that makers are better versed in the art of manufacture today than a decade ago, methods have improved and better materials are to be had with which to construct cars.

### What Depreciation Really Is

Depreciation is a much mooted point in connection with the use of commercial vehicles and, as above stated, it amounts in some cases to a system of bookkeeping. We all know that things mechanical of whatsoever description, regardless of how well they may be built, the quality of the materials employed or the care exercised in the assembly of the components, will wear out just as certain as night follows day. Likewise, do we know, that things mechanical properly cared for, restored on occasion, will last for a long time and such is the case with the commercial truck. Depreciation practically means wear and tear as regards a motor truck should be divided into two classes, wear on the complete chassis and

wear on the minor components that must be replaced once a year, anyway. This is where some interesting versions come in. To say that a truck has depreciated implies that it has worn, that it is not as good now as when it was made or put in service. All parts of a car are subject to wear, thus from a broad view all parts are subject to the classification under the heading depreciation. Then comes the subject of maintenance and up keep. Neither of these must be confused with depreciation. In the opinion of the writer, those minor parts which have to be replaced about once a year should not be classed as subjects of depreciation, but, rather as factors in the maintenance account. In the opinion of the writer, in a gas truck, the frame, springs, wheels, axles, transmission and the like should be regarded as proper under the classification of depreciation. With the electric car it is somewhat different and this gives rise to another interesting complication if such it may rightly be called. In the consideration of this class of vehicles it must be borne in mind that tires and batteries must not be regarded as subjects of depreciation, a point on which there is a difference of opinion existent. The electric then, is subject to this general classification as regards the frame, the wheels, the springs, and other factors when the batteries and tires have been eliminated. It is not surprising that there should be a difference of opinion as regards the batteries and whether or not they come under the heading depreciation. The gas car builders, that is some of them, say that the batteries are classified as subjects of the depreciation account since they are in fact part of the power unit. On the other hand the electric manufacturer says No, batteries are to an electric just what a tank of gasoline is for a gas car, "fuel," "stored energy." But after all, to the man who is about to purchase a car, it makes little difference what theories may be advanced. He wants efficient economical service at reasonable cost. As above stated we know that cars will wear and if they wear it is no crime to regard that wear as depreciation. One individual will call everything including his "up-keep" expenses depreciation, another will have two separate accounts. But regarded as it may be one way or the other, the fact remains that the commercial car of today does not depreciate as fast as some say it does; it is good for greater service than horses, it is the best means of transportation to be had and is in every sense of the word worth while. The prospective buyer will doubtless consider that a cheap car may reasonably be expected to wear out faster than a good one and so on.

### All Depends on the Owner

Nowhere is a thorough system more needed than in motor truck service. Assuming that the user of a car or a fleet of cars is new at the game, so to speak, he cannot reasonably expect to get by the first year following the installation as low, or as cheaply, or as satisfactorily, as he will the years following. If he has never before had cars a new proposition



confronts him; he is inexperienced and liable to mistakes. If he would have his cars in service always, he must necessarily have a system behind those cars, he must forsake "stable" methods for the two have nothing in common. As pointed out above the whole thing depends entirely upon himself; if he wants to keep within ten per cent. depreciation he can doubtless do it if he goes at it right or he can let his cars go to pieces in a jiffy. It may be well set forth at this time that a big house in New York has a number of cars in service, the owners appreciate the advantages of commercial trucks, they know that they do good work and can do it cheaply, economically, but alas they have no system, this they admit frankly and not so very long ago were on the verge of despair as there was no fit man to be had to care for the cars, at least according to their own statements. Here the cars are not given the treatment they are entitled to; the system is "wrong," here cars are likely to depreciate rapidly through neglect. Another case in point is that of a concern to which system was foreign. The service was all horses, the business public service. Horses were gradually supplanted, the bus business grew but it kept the man at the head on an edge continuously to install a thorough system and run things on an economical basis. Thus it is plain that the whole situation is in the palm of the hand of the owners of cars. It is not fair to the truck in service, to the makers or the commercial vehicle interests in general to say that a car will depreciate 20 or 30 per cent. when the cases in point represent installations where system is lacking. The best services should be taken as a basis for computation for it is there that something "tangible" is to be had.

### Car Outlived Its Allotted Life

It is a common practice among some users of commercial cars to set aside a certain sum each month for up-keep and likewise for depreciation, the owners estimating that at the end of the year the car after a season of hard service should be overhauled. It is a common occurrence to thus allot more than is actually necessary to cover the expense involved, but the owners do it to be on the "safe side" so to speak. A case in point: Five years ago Colonel Charles M. Jarvis, of the American Hardware Corporation, in New Britain, Connecticut, purchased for the use of that concern a 12 h. p., four cylinder, 3-ton Daimler truck. He thought at the time of purchase that the car would last four years, so, accordingly depreciation was charged up at 25 per cent. per year. But did that car wear out in four years? Hardly. It is still in service, has outlasted the time set for it and is doing today the same work that was done when the car was installed. Since the truck has been charged off on the company's books at 25 per cent. a year for four years the concern figures that it costs nothing to operate it at the present time. Now then, the point here is, has that truck depreciated? This gives rise for the necessity for one of those hair line decisions. Theoretically the car has worn, it has depreciated, in a sale it would doubtless bring very little, yet, it is worth to the owners just as much as it was five years ago. It might reasonably be expected that some parts of the machine would be more liable to fracture in service now, than when first installed. The owners are very enthusiastic over the car and as above stated feel that since it has been crossed off the books its operation cost is a trifle. It has done the service and is doubtless good for much more. This particular service gives

rise to the point of when does a car depreciate, or perhaps more properly put, when has it depreciated?

That the vehicle has actually depreciated it is reasonable to assume, but the depreciation has apparently been low for the owners estimated 25 per cent. a year, and had the vehicle written off the books in four years and, doubtless they could have waited three or four years more before doing so, judging from present indications. Depreciation here is largely a question of how soon the car will have to be supplanted by another because of its cost of up-keep being in excess of what would be demanded by a similar and more improved machine. Many cars in use today are so inefficient in the consumption of fuel that they will be replaced in possibly two years by cars that are much more efficient. Depreciation in the case of this American Hardware Corporation Daimler truck is pretty much a question of how long can the concern afford to run it in view of possible lower cost of operation of another truck of improved design and construction. But to express this point in a nut-shell the owners here feel that the truck "owes them nothing."

### Another Long-Lived Example

When the prospective purchaser of a truck is told that the things are short lived, expensive in up-keep by the fellow who has hard luck, all due to his own inefficient methods, the above example is worth while of consideration as is that of the Adams Express Company, in New York City. In 1904 that concern which has a vast horse service became interested in motor cars for commercial purposes. The late Levi C. Weir, president of the company purchased a 12 h. p., four cylinder, three-ton Daimler truck in 1904. This truck is still in service so that it has served a life of usefulness extending over approximately seven years. This car was written off the company's books four years after it went in service so that it is on duty three years after that time, therefore, if we are to consider that a car has worn out when it has depreciated and the depreciation here was estimated at 25 per cent. at the outset, the per centage of depreciation is reduced from 25 per cent. as originally estimated to slightly in excess of 14 per cent., and if the car remains in use another year and is then thrown away or scrapped the depreciation based on the years of service drops down to 12½ per cent. Therefore, there is every reason to assume that a good car will not depreciate 20 or 30 per cent. as some contend but, rather, 10 to 15 per cent. This is sufficient evidence.

### Things to Consider

There are other features of the situation that must require deliberation and thought by the man who contemplates purchase of cars. First of all he must put in service the sort of vehicle fitted to his service. If he needs a three-ton truck it is hardly worth while to install a five-ton truck, and if he is using a three-ton truck and is habitually overloading it, he had better secure a larger vehicle. Depreciation is largely dependent upon the sort of fellow who sits at the wheel, whether he considers that he is manning something that cost a few thousand dollars or whether he regards it as he would a dump cart to be abused whenever the whim possesses him and how he travels over bad roads. It is a simple matter for a driver to do vital damage to a machine through carelessness and, if he through carelessness, runs that car into a telegraph pole and wrecks it, the demolition of the vehicle



cannot be called depreciation. Many owners of cars are not at all fussy as to the sort of men employed, a cheap man serves the purpose for many, and in such cases cars do not last as long, that is ostensible on close observation.

Another thing that must be guarded against, and is conducive to large repair bills is habitual overloading, it is poor practice and does not pay. Obviously the fellow who overloads his vehicle and does not consider the fact does not get the service he should in the long run and his maintenance cost must necessarily be high, depreciation under such conditions is in keeping. One must hardly expect much else under such conditions.

### What Some Makers Say

But few of the many makes of commercial cars now on the market were in existence a few years back. Several American builders who had experience with pleasure cars anticipated the wants of the present day and began operations on a commercial scale. Obviously they ascertained a lot by reason of their early entry in the field and are in a position to give some reliable information on the subject of depreciation.

Among the electric manufacturers is the Lansden Company, of Newark, N. J. Here the contention is that the tires and batteries do not come under the depreciation classification, this item having to do with the chassis itself, the motor, axles and the like. Batteries and tires are purchased outright for service and, according to make, will render about so much. It is the practice of users of electric cars to maintain a separate battery account and all factors having to do with this feature of construction are thus recorded. Since there are numerous Lansden electric cars in service the makers are in a position to know approximately just about what depreciation amounts to. From a group of vehicles in various classes of service the estimate is at the very most 10 per cent. per year, thus a car has a life of ten years. This, according to the makers, is well borne out in the case of a car used by the Adams Express Company at Washington. This car which approximates the Lansden design of today was installed early in 1904, so that the machine has been actively used for at least six years. The average yearly service is 295 days. This car was run over the road from Washington to New York, and was shown at the commercial car division at Madison Square Garden. It has done good service and, according to the builders, is just as efficient today as when first installed. It has been kept in condition from year to year which is considered a good illustration by the Lansden builders, that with an annual renewal of minor parts the cars of this make are good for ten years of service easily, hence the estimate of 10 per cent. depreciation a year. The claim was here made that there have been cases where owners have used cars of this make for so long that they felt that it was about time to have new vehicles rather than to continue to employ the old, even though these latter were still good for service. There are New York installations of Lansden electrics where the owners consider the cars after eight years service just as good as ever. With a satisfactory system of care and maintenance these cars are always in good working order and are consequently efficient working units. To keep them in a state of good repair does not involve a large expenditure and the service is far superior to that formerly rendered by the horse equipment. This last statement was made by a large dry goods house on Broadway. In this

case depreciation is hardly considered, the tires and batteries being regarded under a special account. The Lansden Company, by the way, has a guarantee system whereby a Lansden owner is guaranteed satisfactory service. In other words, the car is guaranteed to perform the service for which it is designed.

Another instance in which cars are maintained at 100 per cent. efficiency is that of the service department of the Auto Car Company, at the corner of Market and 23rd streets, Philadelphia. This concern supplies the Autocar delivery wagons for all classes of service including the Post Office department for the collection of mail. The estimate here is that a car depreciates 15 to 20 per cent., all depending on the class of service. Obviously a car engaged for the purpose of transporting meat, for example, where a heavy load is carried each trip there is more strain on the whole car than would be the case in a lighter class of service. In the figures given the estimate is doubtless in excess of the actual amount. There is a complete system involved here, there being facilities for rebuilding a car complete in 24 hours. When repairs are needed they are made. To express the matter in the words of the firm, "we use preventive medicine rather than curative," that is everything is done to promote good service and guard against possible breaks before the break has an opportunity to occur. The contention here is that a car seldom "wears out." Pneumatic tires in this service have a tendency to keep down depreciation, but the tire situation is a subject apart from that discussed here.

The truck department of the Metzger Motor Car Company estimates after a careful compilation of the service rendered by Hewitt cars that the depreciation of Hewitt trucks in general does not exceed 15 per cent. on the heavy vehicles. Some users of Hewitt equipment, by reason of the severe service conditions, figure as high as 30 per cent., but in such cases the equivalent amount is set aside for possible contingencies. For instance Burns Brothers who operate a fleet of Hewitt coal wagons estimate their depreciation at 30 per cent., but the cars here have hard conditions to meet and are used nights as well as days in the busy season. The daily estimate on ten trucks in this service is \$6.17. The New York Telephone Company on the other hand on a five-ton Hewitt truck estimate depreciation and insurance at \$2.12 a day, included in which is interest. The car is working 277 days a year and the entire cost covering a period of two years or 588 working days was \$13.12 a day. The percentage of depreciation in this case is figured at 12½ per cent. which implies that the owners consider their cars good for eight years of service.

In arriving at an estimate of 15 per cent. depreciation on a group of Hewitt trucks, the makers do not take into consideration tires of general minor repairs that go to make up an out and out maintenance account. The contention here is that there are minor features of construction which have to be replaced once a year anyway, as, for example, side chains, the smaller front sprockets, brake bands, and the bands of the planetary gear set, make and break parts on the magneto, new hose, piston rings and the like.

C. H. Martin, of the R. L. Morgan Company, of Worcester, Mass., expresses the opinion that depreciation of a motor truck is an unknown quantity but does not exceed ten per cent. a year; this of course based on conditions that are satisfactory, that is where there is a system of care and

repair of the cars in service. The driver has a lot to do with the situation and he can raise or lower the figures if he feels so disposed.

The authority above quoted has had lots of experience and was formerly identified with the Knox Company, at Springfield. His expression when asked what he figured depreciation was "Depreciation depends upon the man himself and you cannot make that fact any too strong." When told that it was a common impression among some that a motor truck would depreciate 25 to 30 per cent. a year he cited the installation of the Chicago public library of two cylinder horizontal opposed equipment in 1903. The cars are still running and doing good service. Mr. Martin was of the opinion that a truck properly cared for will not wear out, it can be repaired from time to time and render satisfactory service. He was most emphatic as to the longevity of commercial cars. There are numerous Morgan trucks which have been in service for five years and these, if discarded now, would imply a depreciation of 20 per cent., but as they are still serviceable there will be no necessity for throwing them away so that, as the time of service increases, the depreciation diminishes. Mr. Martin is of the opinion that tire equipment has much to do with the depreciation of motor trucks which is discussed elsewhere in this issue.

The Knox Automobile Company are of the opinion that 10 per cent. is a fair estimate of yearly depreciation of

motor trucks though for the first year the figures are liable to be in excess of this. The life of a car, if properly maintained, is ten years, but many users of motor trucks have no satisfactory system of care and maintenance. In cases where motor trucks have never been used previously the first year's depreciation is quite certain to run in excess of ten per cent., for the reason that the conductor of the service may be new and not in touch with various little wrinkles that help to keep down the expense. To say the least depreciation is not as high as some would have the uninitiated believe.

Five years is considered a good life for a commercial truck by the Gramm Motor Car Company, of Lima, Ohio, builders of the Gramm line of commercial vehicles. Here the depreciation per year is estimated to be about 20 per cent., it being figured at the end of five years the vehicle will have given full service and should therefore be replaced by another. Present day conditions are considered in this estimate.

At the Baker Motor Vehicle Company, Cleveland, it was the opinion expressed as regards depreciation of trucks, that is, electrics, that aside from the batteries and tires and the replacement of minor parts, such as bearings, that the car would last indefinitely.

*(To be continued)*

[In the second installment the experiences of various private users of commercial cars will be cited giving their opinions as to motor truck depreciation.]

## The Commercial Car Invaluable to the Farmer

In no line of business can the commercial motor car be put to so many uses as in connection with farm work. The gasoline motor propelled vehicle is no longer being considered by the farmer as a luxury but as a necessity. The uses to which it can be put are unlimited, and many duties that were formerly shirked by the farm hands are now done with vim and eagerness.

A small truck can deliver the milk, chickens, eggs, butter and garden produce to the city markets, and take plow parts, rope, wire fencing and implements of all kinds back to the farm. With the motor truck the trip could be made in less than half the time and at less expense than it would take old "Dobbins" to do it and the farmer could be back home in the meantime working on the farm. In harvest time this is especially valuable, for there would be no long delays in case something should break about the farming implements. He does not have to unhitch a horse from a wagon and hunt up a buggy and harness, but in a second's notice he is off in a cloud of dust and back again in less than half the time.

The automobile is valuable to the dairy man. In hot weather speed is a great item. It means dollars and cents. The tendency is towards a central point. Farmers within a radius of fifteen to twenty miles around this central plant

bring the cream and milk to this creamery or depository. One readily sees the advantage of a reliable motor truck for this purpose in time and labor saving.

The fruit grower is adopting the motor truck. He, too, is anxious to gather his crops quicker and get them to the railroad station sooner, as every minute during the rush of the season means money.

For all kinds of chores around the farm a light, easily controlled and inexpensive car is invaluable. This same car can be used to haul the children to school, to make a hurry-up call for the physician in case of sickness or accident, to take the family to church on Sunday, and not least of all, it is the best argument for better roadways that the farmer of today possesses.

This automobile can be used to run grindstones, to pump water, to shell corn, to lift hay into the loft and to do an endless number of other stunts, depending upon the ingenuity of its owner. It has been found practical to haul bailed hay, fence posts, and all such odds and ends that a farmer performs. It will not do away with the horse, but rather will increase the horse's value by making him more capable for his particular duties.





## Some Details of the Autocar Commercial Cars

The Autocar Company, of Ardmore, Pa., well-known manufacturers of commercial vehicles as well as pleasure cars, have developed to a point of great perfection the single chassis which constitutes the basis of all Autocar trucks, 'busses, station wagons, ambulances, police patrols and hose wagons. This company has for some years been consistently developing this one type of vehicle, the prominent features of the chassis of which will here be taken up in detail.

It need not be stated that the measure of success which has followed this machine, has been in proportion to the painstaking effort on the part of the makers, to produce a truly serviceable and with all, reliable commercial car. No little of this success may be attributed to the concentration of effort on a single chassis.

devices before going into details. Perhaps the most noticeable to the ordinary observer is the patented arrangement for lifting the seat and holding it in a raised position exposing the mechanism. It is impossible to jump or jar the machine by suddenly allowing the clutch to engage.

This is accomplished neatly and without undue complication by means of a small dash pot or glycerine check, which prevents the clutch from engaging suddenly, even though the operator's foot slips off the pedal. At every point care has been taken to guard against the abuses which the average commercial car operator is prone to heap on the defenceless mechanism entrusted to his charge. Overspeeding, being one of the flagrant evils, the makers have effectually put a stop to this form of abuse by placing above the Stromberg carburetor a diaphragm governor which is operated by means of the pressure in the water circulating system and controls a valve limiting the amount of mixture entering the motor, and therefore, limits the motor's speed. This device is arranged with a regulator on the diaphragm so that the owner can set it for any predetermined engine speed, above which the driver cannot make it run.

A seal is fitted at this point so that it is impossible for an operator to readjust or tamper with the governor without this fact be-



Typical Panel Body Autocar.

It will be noted that this truck is fitted with pneumatic tires and, thus equipped, gives economical service.

### Some Unusual Features

The product of nearly every maker shows points of originality in greater or less number. It is, however, uncommon to find a machine with more novel features than found on the Autocar. We will here briefly mention some of these



Autocar with Seat Lifted up by Hand Crank at Side.



ing apparent to all. As a general rule, this device is set so that the car will not run faster than 20 miles per hour on the direct drive. The construction at the rear axle is also unique, a large gear reduction of necessity being used. At this point, the usual bevel drive is employed to operate a short jack shaft above and parallel to the rear axle, this shaft having a spur pinion which in turn meshes with a spur gear on the differential cage. The arrangement is extremely compact and in addition to its other virtues, gives practically a straight line drive with almost no angular motion on the two housed universal joints, there being one at each end of the propeller shaft. In minor details the greatest care is everywhere apparent. For instance, there is a Lunkenheimer glass oil cup, with feed arranged especially to care for the much neglected trunnions engaged by the clutch yoke. Again on the gasoline line between the tank and the carburetor is a sediment cup with

a small pet cock, making it possible to drain off in a moment any water, dirt or other foreign matter which may have collected at this point, thus protecting the carburetor and obviating all difficulty from the numerous troubles which follow from dirt or water in the gasoline. Another feature which is unusual is the use of an armored wood frame. The side frame members are as usual, of channel pressed steel, but the opening of the channel is outward instead of toward the inside as is customary, and neatly fitted into this channel for its entire length is an ash-  
still, a combination forming an elastic and almost non-breakable frame. The cross members are numerous, there being five of channel pressed steel, hot riveted and well braced.

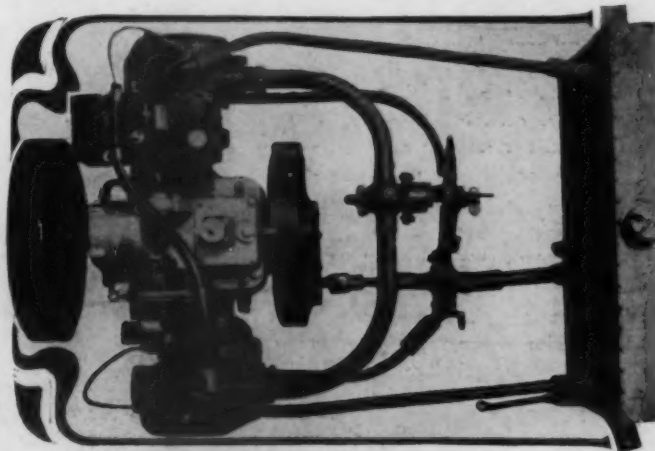
### The Motor

The power plant consists of what might be called the standard, two cylinder opposed Autocar engine, which has been built so long and successfully by this maker. This engine has a bore of  $4\frac{3}{4}$  in. and a stroke of  $4\frac{1}{2}$  in., and is most accessibly placed crosswise under the driver's seat on a channel section, pressed steel sub-frame which is three point suspended. The engine cylinders rest directly upon this sub-frame on suitable bosses, while the rear of the frame carries the compact three speed, selectively operated, change

gear case. The front cross member of the sub-frame is extended to the sills of the main frame and there bolted, while the rear member is semi-circular arch, the top point of which is supported by a large stud, secured to a cross frame member of the main frame. By means of this construction, it is possible to quickly remove the power plant and either the motor or transmission may be removed from the sub-frame without disturbing the other.



Autocar in Brewer's Service.



Plan of Autocar Power Plant.

similar piston rings are used at the top. These rings are not eccentric and are not tinned. The connecting rods are I-section drop forgings with large bearings at each end, the piston pin bearing being bushed with a plastic bronze sleeve bushing  $1\frac{1}{8}$  in. in diameter, 2 3-16 in. in length, and pinned to the connecting rod to prevent rotation. The piston pin is hollow steel for most of its length, one end, however, being solid. A radial hole in this solid portion contains a small spring-pressed locking pin, which under the pressure of a spring engages a hole in the piston boss, effectually preventing the pin from lateral motion. When it is desired to take out the wrist pin, the little locking pin can easily be pushed down into the hole in the wrist pin, disengaging it from the hole in the boss. The big bearing of the connecting rod is plastic bronze bushed, the cap being held by two castellated nuts and cotter pins, two shims are used, a thin one .002 of an inch thick for a first adjustment and another about 3-64 of an inch which can be filed for further adjustment. The crank pin is  $1\frac{3}{8}$  in. in diameter and  $2\frac{1}{2}$  in. in length. The crank shaft itself is a short stiff drop forging mounted on two large annular ball bearings of silent type.

A peculiarity of this engine is the use of two fly wheels,

Needless to say, the engine is of the four cycle type. It is rated by the A. L. A. M. formula as 18 h. p., the cylinders are the usual gray iron castings, rough bored, then annealed when the finishing touch is taken, exact size being obtained by grinding and finally by lapping the pistons and rings, thus making the fit at this important place as good as could be desired. The pistons themselves are also gray iron castings, thickened at the bottom where a step jointed ring is used. Three



**A Unique Body Decoration.**

one of which has fan blade spokes, and the other houses the floating ring clutch. This disposition of the fly wheel weight, it is claimed, makes a very well balanced and smooth running motor, and imposes less strains on the crank shaft. The crank case itself is a cast iron construction into which the cylinders fit and are bolted in the usual manner. The valves are both on the upper side in integral chambers. These valves are a two piece construction, cast iron heads, threaded and brazed to nickel steel stems. Both are mechanically operated and interchangeable. The plungers are of circular section and operate in the upper half or cover of the case, so that by removing this upper half these rods are carried with it. They have offset ends fitted with hardened cap screws and lock nuts providing adjustment. The end of the valve stem is also hardened. The oiling system is by means of a McCord lubricator mounted on top of the engine and driven by a bevel gear on a short shaft from the half-time gear train. The oil is forced into the case, splash lubrication taking care of all parts. This same shaft which drives the oiler extends also to the Bosch magneto which is also mounted on top of the case. The oiler is mounted on a bracket, cap screwed to the case, the oiler being held to this bracket by means of a yoke and thumb screw so that it can be removed instantly without the use of tools. The cam shaft, as usual in this type of engine, is placed crosswise at the top of the case and is so mounted in its bushed bearings that removal of the cover leaves it in position, thus the timing is undisturbed. These gears are of the straight spur gear type.

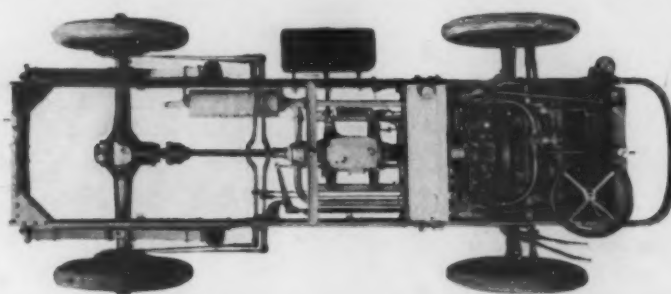
### Change Speed Mechanism

The transmission gears are high carbon steel hardened with 6-8 pitch, the width of face varying from  $\frac{3}{8}$  to  $1\frac{1}{4}$  in. The sliding members are on a squared shaft above the main case. These are mounted on Timken roller bearings, each provided with an adjusting plate with notched periphery into which small spring pressed plungers fit, locking the adjust-

ment. By temporarily pushing out the pin a plate can be moved a small fraction of a turn, when releasing the pin again locks the adjustment. All shafts and gears can readily be removed from this case without disturbing it in its mounting on the sub-frame by four integral channel section cast aluminum arms. The transmission case is in one piece with a single cover plate, the removal of which exposes the entire inside of the case. On the side is a hand hole plate which gives immediate access to the gear shifting fork, so that this member can be placed so as to bring the gears in exact alignment. The gear ratios in the case are as follows: direct drive, intermediate speed 2 to 1, low, 4 to 1 and reverse 5.33 to 1. Lubrication is as usual by a bath of oil. The drive from this point to the special construction at the rear axle is by naked shaft with a universal joint at each end boot and packed in grease.

### The Three-Ring Clutch

The clutch used on all Autocars is a gradual development from former types and consists of a bronze floating ring about 14 in. in diameter, spline driven from its outer edge by feathers or splines set into the inner periphery of the fly wheel opening which receives the clutch. This ring is gripped between two cast iron plates which drive the clutch shaft, and between which the ring is pressed by means of three toggle joint operated set screws. The yoke on the clutch shaft engages a trunnioned ring to which the toggle links are connected. These trunnions are lubricated as before mentioned by a special oil cup. The clutch is controlled by the left pedal, the right pedal operating the rear exterior contracting band brake. Steering is on the right side by the usual hand wheel. Although a spark and throttle lever are arranged on notched arcs below



**Plan of Autocar Chassis.**



**Autocar Rear Axle Assembly**

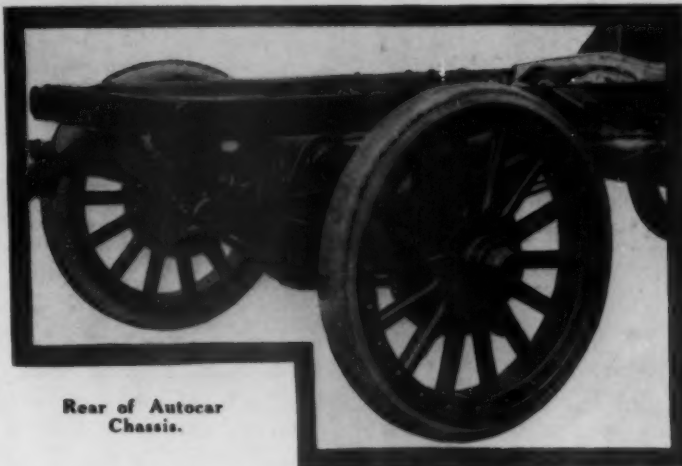
the wheel on the steering column, nevertheless, the spark can be almost disregarded while running, making it fixed, the ignition is by magneto, the intensity of the spark increasing with the speed. This leaves practically nothing but the throttle to be operated aside from the gear shift lever. This gear shift lever is of the selective type, three speeds forward and one reverse. The side hand lever controls an internal expanding 14 inch diameter by 2 inch face emergency brakes, both brakes operating on a single drum and both faced with raybestos. These brakes are operated by pull cables, operating toggle like expanders.

### Rear Axle Assembly

The rear axle is of the full floating type, the wheels being mounted on Timken bearings. The housing is composed of a special grade of malleable iron with spring seats and brake supports cast integral, with heavy steel tubing pressed into the housing and secured by clamp screws. The bevel pinion shaft and the jack shaft run on Timken bearings mounted in caps, screwed into the actual housing and by means of the adjusting mechanism mentioned in connection with the change gears, not only the adjustment of these bearings, but the proper meshing of the bevel pinion and gear can be regulated. By means of this double gear reducing, a smaller housing is used and a reduction as large as 6 to 1 on the direct drive is obtained. By removing the upper portion of the housing which carries the jack shaft, all the gears with the exception of the large spur gear on the differential may

be removed without disturbing the axle. The live axles proper may be withdrawn without disturbing the wheels or jacking up the car as these axles simply transmit the torque to the wheels through lug clutches at their out ends engaging similar clutches on the wheel hubs.

The front axle is a straight heavy tubular construction, fitted at the ends with heavy yokes with integral sleeves and spring seats, giving great strength at this point.



Rear of Autocar Chassis.

### The Springs

Contrary to the usual practice on small trucks, the Autocars are equipped with semi-platform rear spring 40 in. long. These have  $2\frac{1}{2}$  in. leaves, 11 in number. The side springs are linked at the rear to the cross spring which is rigidly held at the center by clips to the rear cross frame member.

The front end of the side springs are carried on a one-inch diameter spring bolt, fitted with oil cups. The front springs are semi-elliptic, ten leaves  $2\frac{1}{4}$  in. wide, shackled at the rear and carried at the front on  $\frac{3}{4}$  in. diameter spring bolts, also fitted with oil cups. This fitting of oil cups to these places is in keeping with the thoroughness of the Autocar system of lubricating every moving part of the car.

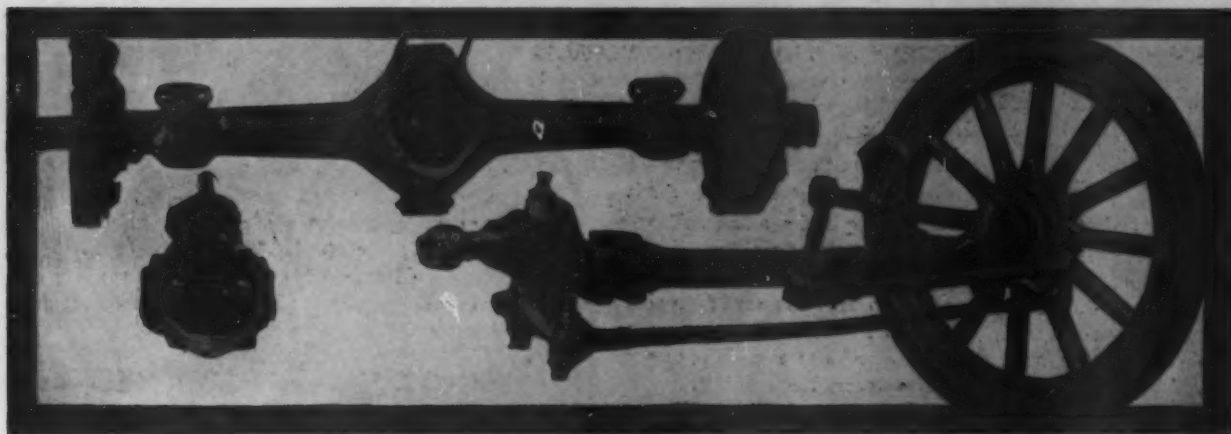
Under the driver's seat and mounted on the chassis is the eleven gallon gasoline tank with gravity feed to the Stromberg carburetor.

On the upper side of the frame, wood strips or sills are placed and clamped, making the entire sides smooth so that the body can be slipped into place easily and does not have to be notched over bolts or rivets.



The Autocar Unit Power Plant on Subframe.





Details of Front and Rear Autocar Axles.

### Bodies

All types of bodies are supplied, the price of the car being for the chassis, \$2,150. The carrying capacity is stated as 3,000 lbs., and the wheel base is 97 in. The usual equipment of lamps and tools is supplied.

Solid tires are used on all wheels, those on the front being 34 x 3½ and on the rear 34 x 4. The rims as supplied are of the bolted on type for solid tires. Pneumatic tires are also used on these cars, particularly on models in ambulance, police patrol or fire service.

All cars have the front seats so arranged with a system of levers that an operator can, single handed from the side of the car, by means of a crank, instantly raise the seat and

the box support under it, up out of the way of the engine, in which position it remains automatically until lowered by the driver into position again. With the seat raised the engine, oiler, magneto, carburetor, etc., are exposed and are very accessible.

The steering gear is of the bevel pinion and sector type, mounted substantially at the right extreme forward corner of the frame, the connecting links to the wheels being in front of the axle. These connecting rods are substantially constructed with yoke ends. One and a half turns of the steering wheel suffices to swing the front wheels through their full radius and with a machine as short as these, 1½ ton trucks, this means great facility in handling in traffic.



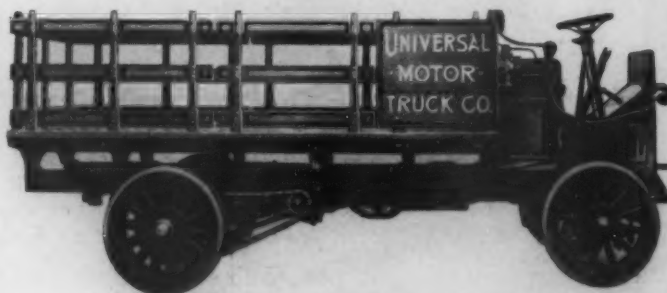
## Universal Three-Ton Truck

It is something more than six months since the Universal Motor Truck Company was organized in Detroit, Mich., for the purpose of putting on the market a three ton truck that had been given an exhaustive try out. The Universal Motor Truck Company was started as a close corporation, with a capital of \$350,000, and it remains the same today. C. H. Haberkorn is president; Louis Kamper, vice-president; Morse Rohnert, secretary and treasurer, and A. E. Barker, general manager, and V. Link, chief engineer. The company has just moved into its new \$200,000 plant, which is four stories high, 64 x 254 feet in size, of fireproof construction throughout, and contains the most modern mechanical equipment obtainable. The building is of steel and concrete construction, light and airy, and is complete in every detail. At the present time a three ton truck is being marketed, and this will shortly

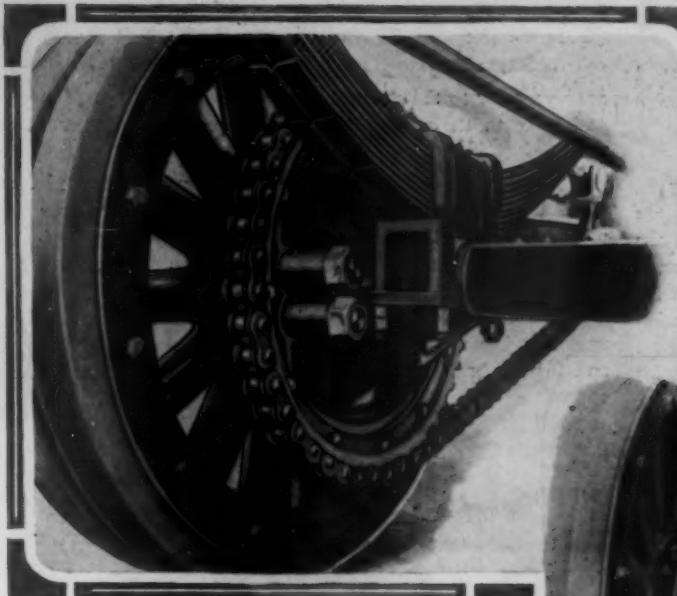
be supplemented by a three thousand pound truck designed along similar lines, although of course on a smaller scale.

There are many things about the Universal three ton truck that mark it as out of the ordinary, for while all the practices are standard, convention has repeatedly been disregarded in giving them application and originality is frequently in evidence, as witness the arrangement of the power plant whereby the radiator and fan flywheel are placed at the rear of the motor, instead of in front. The mechanism has been divided into two distinct units—the power plant comprising one and the transmission and driving mechanism the other, each so cleverly designed and so well balanced that the veriest tyro could not go wrong in the matter of assembling.

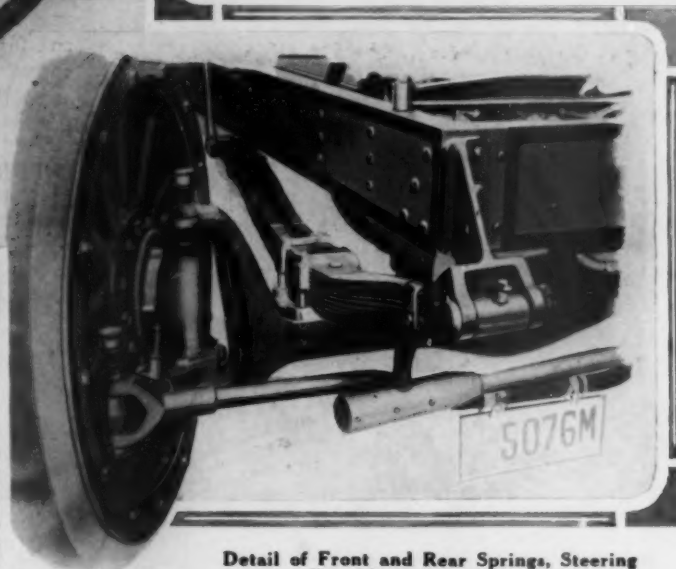
Summarized briefly, the Universal three ton truck has a four cylinder vertical water cooled motor of 30 h. p.; selec-



Universal Three-Ton Truck



The same quality of steel is employed in the crank shaft, which is of three point type, the bearings being of very liberal size. The forward bearing surface is  $4\frac{1}{4}$  inches long, the middle  $3\frac{1}{2}$ , and the rear, which supports the fly wheel, is  $4\frac{1}{2}$  inches, all of Parsons white brass, pillar block type. The diameter of the crank shaft is  $1\frac{3}{4}$  inches on the forward and middle bearings, and 2 inches on the rear. Connecting rods have a cap at the bearing end, held in place by four bolts, with shims for adjustment.



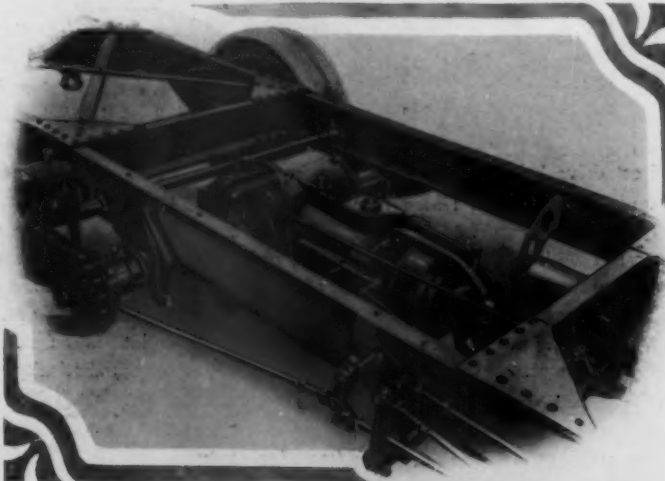
Detail of Front and Rear Springs, Steering Knuckle and Connections.

tive sliding gear transmission, with three speeds forward and reverse; double side chain drive, 68-inch tread, 132-inch wheel base; a maximum speed of 12 miles per hour, and with standard chassis and equipment sells for \$3,200.

The motor is of vertical type, the four cylinders being cast in pairs from close grained grey iron, with integral water jackets of unusually liberal dimensions. The motor develops thirty brake h. p. at 900 revolutions per minute. It has a four inch bore and the long stroke principle is given application, the stroke being  $5\frac{1}{2}$  inches. The valves are placed on opposite sides, the inlet being at the right and the exhaust at the left. They have nickel steel heads welded to carbon steel stems, the seats have an angle of forty-five degrees, and the valves can be easily removed by unscrewing the cast iron valve plugs in the cylinder heads.

The two cam shafts are  $3\frac{1}{2}$  per cent. nickel steel drop forgings 1 5-16 inches in diameter between the bearings and one inch on the bearings, with cams forged integral, carefully ground and hardened.

Pistons are of grey cast iron, fitted with four rings, all of which are located above the wrist pin. The latter is of  $3\frac{1}{2}$  per cent. nickel steel, fastened to the piston by a lock and set screw, with the bearing in the connecting rod running on Parsons white brass. The connecting rod is 40 per cent. carbon steel drop forging  $11\frac{3}{4}$  inches center to center. For the piston pins  $3\frac{1}{2}$  per cent. nickel steel is used.

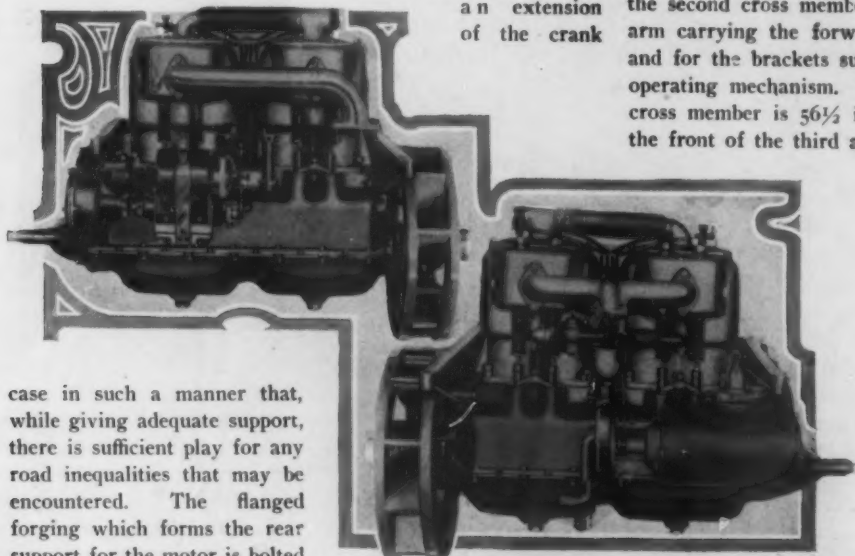


Chassis Showing Transmission Case and Jackshaft

Cooling has been worked out in a manner that, while different from the ordinary method of procedure, proves very efficient. The motor is water cooled, circulation being maintained by means of a centrifugal pump driven off the governor shaft. The cylinders are very liberally water jacketed, especially around the heads, and a sufficient supply is assured through the use of  $1\frac{3}{4}$ -inch inlet. As noted above, the usual order of things has been reversed, and the radiator has been placed at the rear of the motor. It is of cellular design, and of ample dimensions. Located as it is well back under the driver's seat, it might with reason be expected that cooling would be difficult. Quite the contrary is the case, and thereby hangs a story in itself. Air circulation is obtained by means of a sirrocco fan formed integral with the flywheel, and which is a patented device of the Universal Company. This flywheel, with its peculiarly shaped blades, is located just forward of the radiator in a complete housing. The design

of this fan is plainly disclosed by a study of the motor plan. In action it draws a surprisingly strong current of air from the front, the course being upward until it strikes steel deflectors on the upper portion of the housing, when it takes a course in the direction of the radiator.

Motor suspension is of pivoted block type at the front, with two-point stationary suspension at the rear. A flanged forging of ample size is retained by 9-16-inch bolts on the main side members of the frame, immediately in front of the crank case. In the center of this forging is an oval aperture into which fits an extension of the crank



case in such a manner that, while giving adequate support, there is sufficient play for any road inequalities that may be encountered. The flanged forging which forms the rear support for the motor is bolted securely to the rear of the crank case, immediately forward of the flywheel, and rests at either side on the main side member, being held by 9-16-inch bolts,  $2\frac{1}{2}$  inches long. This gives a three-point suspension that has proved very satisfactory.

Ignition is by jump spark, a Bosch dual type magneto located at the left of the motor being driven from a gear in mesh with the cam shaft, with a storage battery in reserve.

The clutch is a very efficient example of multiple disc dry plate type. The six friction discs have a ten inch outside diameter, and are seven inches inside, contact being raybestos to steel, with a gradual but positive engagement. The clutch is enclosed in a sheet steel housing.

Three-point suspension is again exemplified in the transmission, the case for which is made integral with the differential and jack shaft housing, forming the second unit. Transmission is of selective sliding gear type, with three speeds forward and reverse, direct drive being on high gear.

Gears are of  $3\frac{1}{2}$  per cent. nickel steel, with 1-inch face and 5 pitch, and are carried in a cast iron case integral with the differential gear and counter shaft. The forward end of this case is supported by a torque arm integral with the clutch shaft bearing bracket and running forward to the center cross member, as shown in Fig. 4. Timken roller bearings of large size are used throughout.

The counter shaft is of special axle steel,  $1\frac{3}{8}$  inches in diameter, and is carried at its outer ends on heavy brackets riveted to the side members of the frame. Final drive is through double side chains, carried at the front on steel

sprockets keyed to the driving axle. These sprockets are 29-32 inches in thickness and have 15 teeth with  $1\frac{1}{2}$  pitch. Whitney chains, 1 inch in width with  $1\frac{1}{2}$  pitch, are used to convey power to the rear wheel sprockets, which are of steel, with 45 teeth, the same width and pitch as those on the counter shaft.

Ten and one-half pound channel section steel is used for the frame, joints being cold riveted, with gusset plates employed wherever they would prove of assistance in strengthening. There are four cross members, counting the one at the extreme front. From this it is  $71\frac{1}{2}$  inches to the rear of the second cross member, which serves as a support for the arm carrying the forward end of the transmission housing, and for the brackets supporting the clutch and service brake operating mechanism. From here to the front of the third cross member is  $56\frac{1}{2}$  inches, there being 52 inches between the front of the third and the rear cross members. The latter, contrary to usual custom, is located 18 inches from the extreme rear ends of the side members, this giving ample strength, in that quarter, and simplifying the process in the event of a shorter frame and platform than the standard type being required. The frame is 38 inches wide, 6 inches deep, with 2-inch flanges, and is put together with  $\frac{3}{8}$ -inch rivets.

Both front and rear axles are rectangular section forgings of  $3\frac{1}{2}$  per cent. nickel steel. The front is  $2\frac{1}{4} \times 3\frac{1}{2}$  inches in diameter, dropped in the center, and measures 55 inches between the centers of the steering knuckle bolts. The rear axle is  $2\frac{1}{4} \times 3\frac{3}{4}$ . The front axle is yoked at the ends for steering knuckles, the bolts for which are drop forged steel, the bearings being steel bushings hardened and ground, with bronze to steel bearings on the spindle thrust. Steering arms are drop forged steel,  $2\frac{5}{8}$  inches in diameter.

The truck is equipped with two sets of brakes. The emergency operates with a lever at the driver's right, and is internal expanding metal engaging on the rear wheel drums. Both sets of springs, designed to carry the maximum load for which the car is intended, are semi-elliptic, the front being 48x3 inches, and the rear 52x3. A bracket bolted to the front of the frame, as shown in Fig. 5, serves as a hanger for the front end of the forward spring, the rear end being carried by a re-acting hinge, with a cast steel spring pad and two drop forged clips bolted through flanges on the front axle anchoring the springs at this point.

The truck has a wheel base of 132 inches, 68-inch tread, and weighs 5,450 pounds. It has an overall measurement of 16 feet 8 inches. The platform length for standard chassis is 12 feet 4 inches, although option is given on other dimensions, while the width is 6 feet. It has a maximum speed of 12 miles an hour, automatically controlled by a governor on the motor.

With standard equipment, including odometer, side and tail lamps, horn, special wrenches and complete set of tools, the truck lists at \$3,200, f. o. b. Detroit.

With standard equipment, including odometer, side and tail lamps, horn, special wrenches and complete set of tools, the truck lists at \$3,200, f. o. b. Detroit.



# PIERCE-ARROW WORM DRIVE TRUCK

BY E. S. FOLJAMBE

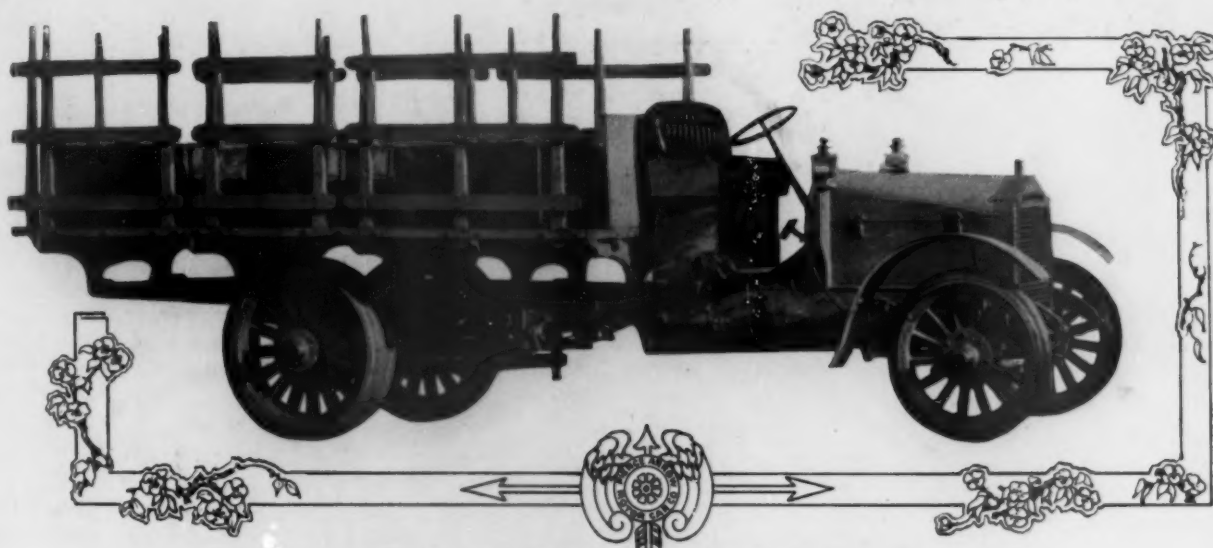
THE PIERCE-ARROW MOTOR CAR CO., of Buffalo, N. Y., are now devoting some attention to the manufacture of commercial vehicles, and have just placed on the market a new 5-ton truck having many unique features.

This company has been quietly developing this truck for the past four years, testing out the various improved models in the heaviest kind of service on the roads, and the truck now offered the public is the result of these four years of labor.

ened steel, prevented from side slip by set screws passing through piston bosses, the said screws being prevented from backing out by prick punching the metal of the boss into the screw.

## Connecting Rods

The connecting rods are I section drop forgings, the big end bearings consisting of loose bronze boxes, babbitt lined, caps held by four bolts each with castellated nuts. The upper



New Pierce-Arrow Worm Drive Truck with Stake Body.

This machine is notable on account of the use of a worm drive, this being a most unusual feature.

## A Substantial Engine

The motor is of 4-cyl., 40 h. p. type, water cooled, cylinders cast in pairs of T-type. The crank case as usual is of aluminum with a horizontal division at the center line, the crank shaft being mounted in three babbitted bearings supported from the upper half of the case by bolts running through from the top with castellated nuts. This engine is supported by two cast steel I section cross frame members, the rear one being bolted rigidly to the rear end of the case with its end supported on the side frame members, while the front one is also supported by the side frame members but carries the crank case at a single point at the middle by a flexible joint, giving a true three point suspension to the motor. The pistons are 4 $\frac{3}{8}$ -in.x6-in. fitted with four eccentric diagonally cut piston rings above the wrist pin, the latter hollow hard-

end of the connecting rod is fitted with a bronze sleeve bearing, non-adjustable, with its bearing on the wrist pin which is held rigidly in the bosses.

The crank shaft is of nickel steel turned from the solid, the bearings being 2 $\frac{1}{4}$  inches in diameter, the connecting rod bearings being also 2 $\frac{1}{4}$  inches in diameter by 3 $\frac{1}{2}$  inches in length. The lower half of the crank case as usual forms an oil reservoir and carries the gear oil pump operated by skew gears from the exhaust cam shaft, it is placed on the left under side from the driver's seat. The half-time gears are spur, the same as on the Pierce-Arrow touring cars, the steel gear on the crank shaft meshing with the cam shaft gears proper. These gears are encased, there being a partition between them and the crank case proper and are provided with an oil feed, the overflow from the half-time gears passing into the the crank case, these gears operating in an oil bath, no grease being used.

### Ball Governor Limits Speed

The half-time gear of the inlet cam shaft contains a ball governor operating directly on the throttle to limit the speed of the engine to 900, corresponding to 13 miles per hour on the high.

The cam shafts have four hard steel cams applied, the shafts themselves being mounted in three bronze bearings of sleeve type, the entire shaft being removable through the front of the case.

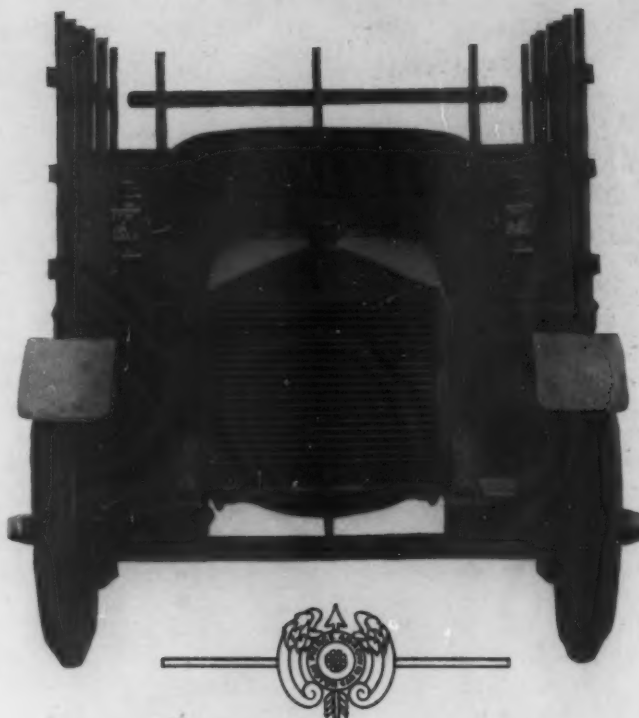
The exhaust is carried away by a manifold provided with a machined slip joint which takes care of any expansion due to the heat and which therefore does not affect the cylinders. This manifold is enlarged at the rear end to take care of the increased volume of gas.

The muffler is of the same general type as used on the Pierce-Arrow touring cars. A 25-gallon steel tank provides the gasoline supply and is carried under the driver's seat, feed being by gravity to the carburetor. On the dash is arranged a small hand priming device by means of which a spray of gasoline can be forced into the intake pipe for starting in cold weather.

A 6-blade fan is adjustably mounted on a bracket carried by the front cross frame engine support and driven by a leather V-belt from the engine shaft.

### A Well-Tried Oiling System

The lower half of the crank case carries about 1 gal. of lubricating oil which is sufficient under ordinary conditions for about 250 miles. This oil is drawn from the case by a gear pump and forced into a tank at the side and above the cylinders. A gauge on the dash shows at all times the quantity of oil in this tank. From the tank it feeds by gravity to the half-time gears and to each of the main bearings, there being hollow ducts through the crank webs to the crank pins thus providing ample lubrication at this important point, not only due to centrifugal force, but also to the head due to the raised tank. The overflow from these bearings and the half-time gears passes back into the pump at the bottom. Strainers are provided for the oil as it leaves the tank, so that all oil is strained before reaching the bearings. The fly wheel is about 17½ inches in diameter of the usual cast iron construction and is bolted to an integral flange of the crank shaft, this fly wheel being coned out so that its inner surface is engaged by the bronze facing of an aluminum cone clutch, giving a metal to metal contact.



### Ignition

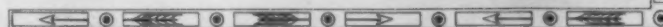
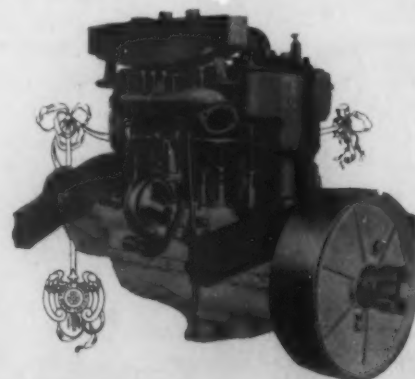
Two entirely independent systems of ignition are provided, one consisting of the Bosch magneto and the other of storage battery with 4 unit auto coil on the dash with master vibrator and separate set of plugs placed in the sides over the inlet valves, the magneto plugs being placed in the heads over interposed between it and the train of gears to facilitate ease on an integral bracket of the crank case on the right side and shaft driven from the half-time gears, a dog coupling being interposed between it and the train of gears to facilitate ease of removal. The spark is adjustable on both magneto and battery ignition from

short, hand lever on the steering wheel column. The carburetor is of the regular float feed type as used on the Pierce-Arrow touring cars. Throttle is controlled from the steering wheel and also by a foot accelerator button.

The steering gear is of the worm and nut type enclosed in a cast steel housing bolted to the right side frame member and connected to the right steering knuckle by the usual type links with ball and socket ends, the cross connecting link being at the rear of the front axle.

### Cooling

The engine is water cooled by a centrifugal pump mounted at the left, shaft driven from half-time gears, water entering the jackets at the lower side near the exhaust valves,





leaving the jackets at the head through a brass pipe hose connected to a horizontal tube radiator, this radiator being mounted on the front cross frame member, and containing with the jackets 10 gallons of water. The filler cap on the radiator is elliptic in shape with a hinge locked cap so that pouring water into the radiator from a bucket is a simple matter, most of the water going into the radiator instead of everywhere else.

The clutch is operated by the usual pedal by the left foot, these pedals having very large surfaces. The clutch pedal disengages the clutch in the usual manner by a yoke on a cross shaft, this yoke having pins engaging a solid bronze ring which bears against a thrust ball bearing to draw the clutch out compressing the usual type of coiled spring. Spring adjustment is by a locked collar.

At the rear of this yoke a shaft extends into the change speed gear case, the forward end of this shaft being a universal joint which takes care of any slight motion due to weaving of the frame and facilitates the removal of this short shaft when it is desired to take out the clutch or transmission. The rear of this short shaft before entering the transmission is also provided with a cross pin type universal joint. The forward end of this shaft has integral cross arms forming pins upon which are pivotally fitted, hardened blocks sliding between blocks in a ring, this combination forming a universal coupling.

### The Change Gear Case

The change speed mechanism contains a 3-speed sliding gear construction, lay shaft at the side, both shafts mounted in Hess-Bright ball bearings, all housed in a horizontally di-

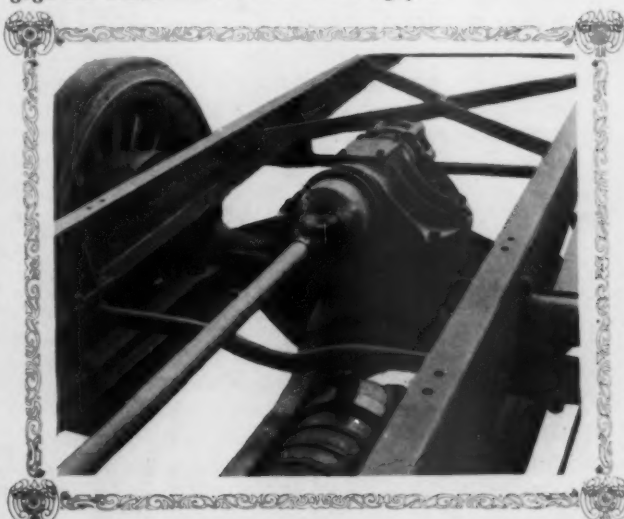
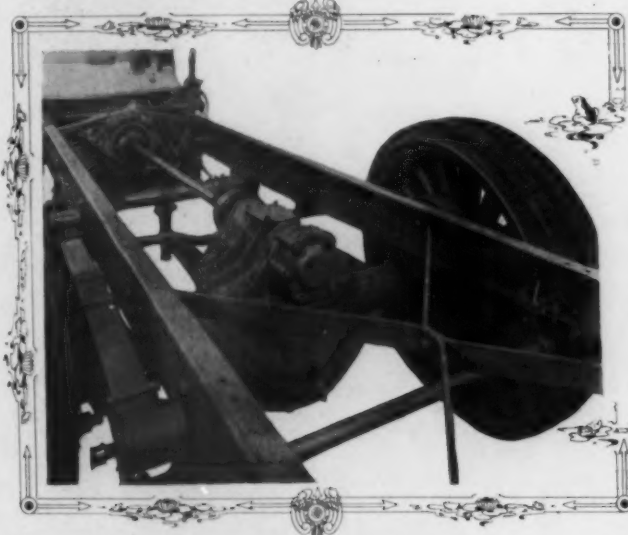
vided aluminum case, with three point suspension. The front of this case rests on a tubular cross member carried in castings, bolted to the side of the frame sills, the other two points of suspension being at the rear to a pressed steel girder-like cross frame member which also forms anchorage for the transmission brake. The gears themselves are of chrome nickel steel  $1\frac{3}{4}$  inch face, and provide three speeds forward and a reverse, selectively operated. The sliding members operate on a shaft with six splines and keys milled integral with the shaft. At the brake end of the main shaft a double ball bearing is used. The gear shaft rods are entirely within the case, their ends extending into a brass oil-tight cap so that no oil can drip out of the case. A feature of the transmission is an arrangement by which one gear shift lever has to be in neutral position before the other lever can be moved so as to mesh the gears. This is accomplished by V-shaped notches in these levers in which a steel ball rests, one lever cannot be moved unless the ball is in the notch in the other lever, which insures one of the levers being in neutral position, and therefore the proper engagement of the gears. The gear shifting levers are also interconnected with the clutch in

gear shifting levers are also interconnected with the clutch in such a way that the clutch cannot be engaged until the gears are fully in mesh.

### An Interlocking Device

A sector with holes in it is clamped to the cross shaft of the change gear lever, by connecting links to the clutch. A pin drops into these holes when the clutch engages, if the pin cannot enter one of the holes, the clutch is prevented from engaging and the holes are so arranged in the sector that the pin cannot enter unless the

gears are fully in mesh. Pushing the clutch pedal to disengage the clutch withdraws this locking pin.





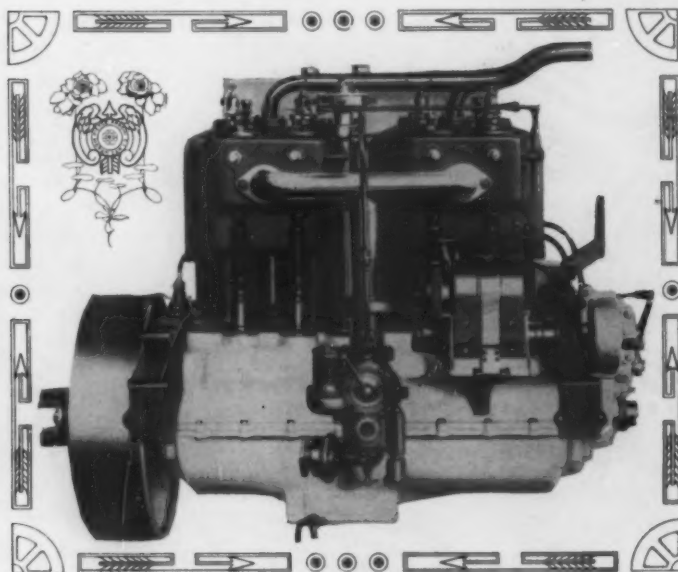
The gear shift lever operates in an H-grid bolted to the right side frame member. The concentric tube and shaft which connect to the transmission are mounted in a spherical bearing at each end so that any twisting of the frame does not cause a bind. The inner end of the transversely placed shaft carries an arm which, after the well-known manner, engages the gear shifting rods inside of the transmission case.

The truck is geared to do  $3\frac{1}{2}$ ,  $6\frac{1}{2}$  and 13 miles per hour on the low, intermediate and high, respectively, but a speed of from  $3\frac{1}{2}$  to 13 m. p. h. can be maintained on high gear when running on the level.

### A Novel Brake

At the rear of the pressed steel cross frame member, which supports the transmission, is a powerful brake of unusual construction; this consists of a chilled cast steel drum which is engaged by two renewable cast iron shoes very similar to those used on the driving wheels of locomotives and clearly shown in an accompanying illustration.

The right brake pedal through the usual pull rod and arm rotates a sleeve with cam-like end which forces the ends of



two pivot levers together, causing the iron shoes to grip the drum. These shoes when released are positively raised from the drum by means of coiled springs, the drum is 10 inch diameter by  $3\frac{1}{2}$  inch face.

The rear wheels are provided with 20 inch diameter pressed steel drums against which internal Raybestos faced cast steel shoes are forced by the rotation of square cams at the end of an arm connected to the brake pull rods. These drums have  $4\frac{1}{2}$  inch face and the brake shoes are pivoted at the rear; this pivot like all the others on the chassis, being provided with a grease cup. These brakes are operated by a side hand lever which is of pull type; a short, single balance type of equalizer insures equal application.

At the rear of the transmission brake is a driving shaft which is fitted with Universal joints of

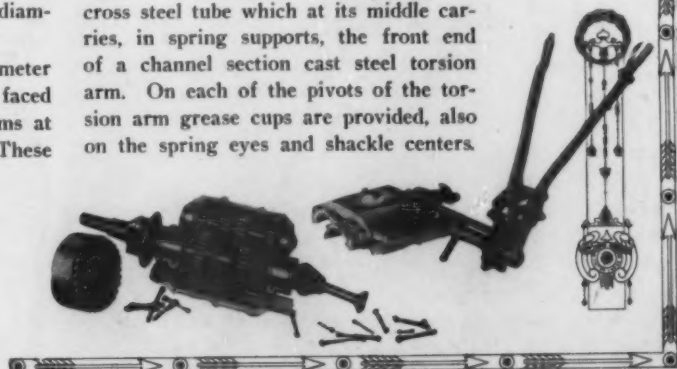
cross pin type at each end, the pins in these joints are hardened steel operating in renewal bronze bushings and both joints are completely encased with leather boots filled with grease.

### The Worm Drive

The above-mentioned driving shaft connects with a case hardened 5-threaded worm approximately 4 inches in diameter with about  $1\frac{1}{4}$  inch pitch, this worm meshes with a 14 inch diameter worm wheel of bronze; the worm is mounted in annular and thrust ball bearings in the upper part of a heavy cast steel housing at the center of the rear axle, this same casting carries the ball bearings upon which the worm wheel is mounted, so that the relation between the worm and the wheel is unalterable as far as any motion of the parts of the mechanism is concerned. This worm wheel is in reality an annular ring bolted between the two halves of a differential case similar to that of a bevel gear driven axle, the differential being of the spur gear type using three sets of gears. The worm and worm wheel give a reduction on the direct drive of 7.8 to 1.

### Rear Axle Construction

The cast steel housing before mentioned, of course, forms the center of the rear axle; into this are pressed under hydraulic pressure heavy nickel steel tubes, upon the outer ends of which are mounted the driving wheels on large Timken roller bearings. Surrounding these tubes are castings forming spring seats. These castings are notched into the central housing and form a pivotal anchorage for the heavy channel section cast steel radius rods, which are mounted at the forward ends on Universal joints, bolted to the side of the frame members. These castings also form a support for a cross steel tube which at its middle carries, in spring supports, the front end of a channel section cast steel torsion arm. On each of the pivots of the torsion arm grease cups are provided, also on the spring eyes and shackle centers.



The wheels are very heavy artillery type, the rear wheels being fitted with dual solid tires 41 inch diameter  $\times$   $5\frac{1}{2}$  inch width. The front wheels are fitted with single solid tires 36 inch diameter, 5 inch face. The front wheels are also mounted on Timken bearings. The front axle is a drop forging of mild steel with integral spring saddles on top forming a support for the short semi-elliptic springs. The rear springs are mounted on top of the axle with two heavy clips. The rear spring shackles are machined from a solid block of cold rolled steel and are pivoted on the extended ends of heavy circular section solid cross bars supported in cast steel brackets bolted to the side frame members.

### A Solid Frame

The frame is of pressed steel, channel section. There are four cross frame members, all but one being tubular. In ad-

dition to this the front and rear supports of the engine also form cross frame members. The frame is 20 ft. over all, the wheel base 13 ft. The rear overhang is approximately 6 ft. The loading platform is 12 ft. $\times$ 7 ft. and the height of the floor is 3 ft. 10 in. from the ground when loaded to the normal capacity of 5 tons.

The entire mechanism of the car is protected on the under side by a sheet steel pan and a short running board is fitted; the storage batteries are carried in a case on the running board.

The dash is cast aluminum, also the foot boards which have a checkered surface.

The price of the chassis, including the tires and driver's seat, lamp equipment and tools, is \$4500. Various type bodies can be supplied, prices varying according to their size, finish and equipment.

## NEW FIVE-TON ALCO TRUCK

The American Locomotive Company, 1886 Broadway, New York City, after a thorough study of four of the best machines of Europe, has incorporated the meritorious features of each in its new 5-ton product. These foreign trucks were put into service at various locomotive building plants of the company, where heavy loads are constantly handled, and their performance was watched and their design studied for a year by the engineers before establishing the design in the new Alco truck. The 5-ton truck follows exactly the same lines as the 3-ton, with a heavier chassis, more powerful engine and generally stronger structure.

Like the 3-ton truck, the 5-ton has a 4-cylinder vertical engine, with  $4\frac{3}{4}\times 5\frac{3}{4}$  cylinders, giving a piston area of 66.44 square inches and displacement of 389 cubic inches, and produces 36.1 horse power upon the rating of the A. L. A. M. It has jump spark ignition with a Bosch high tension magneto and force feed and splash lubrication. The clutch is of the multiple disc type. It has a sliding gear transmission of the selective type, with three speeds forward and one reverse with chain drive. The service brakes are of the expanding type in sprocket drums on the rear wheels, the drums being six inches wide by twenty-two inches in diameter and pedal operated. The emergency brakes are of the contracting type, one drum in each countershaft, the drums being 4-inch face by 11 inches diameter, operated by a hand lever.

This truck provides a carrying capacity of 10,000 pounds upon the standard wheel base of 134 inches. The treads are 69 inches for the front wheels and 72 inches for the rear wheels with tires of solid rubber, 36 $\times$ 6 inches, for the front and dual tires, 42 $\times$ 5 inches for the rear wheels. Semi-elliptic springs are used throughout with an auxiliary cross spring over the rear axle. This frame has a width of 44 $\frac{1}{2}$  inches and length of 18 feet 6 inches, with a width over the hubs of 86 inches in front and 86 inches in the rear, the loading space being 14 feet standard, the width being optional. When loaded the height to top of frame is 36 inches. This chassis weighs 7,600 pounds. Thirty gallons of gasoline are carried in the main tank, and eight gallons in an auxiliary tank, from which the auxiliary supply may be pumped to the main tank by means of a hand pump. At 1,000 revolutions of the motor, the truck makes the following speeds: On high gear, ten miles an hour; intermediate gear, six and one-half miles an hour; low gear, three and one-eighth miles an hour.

## CONTRIBUTIONS FROM COMMERCIAL MOTOR CAR OPERATORS

Drivers of commercial motor cars or the men in charge of garages or shops are invited to send short contributions to THE COMMERCIAL CAR JOURNAL on any subject which will be of interest to our readers. Such matters as difficulties encountered and overcome, tips on roadside repairs, or shop repairs, interesting photographs, unusually meritorious performances of any kind.

Send a post card, or a letter or a sketch, no matter how short or how written or how worded, we will put it into proper shape and redraw the sketches where necessary. When writing use one side of the paper only and give your own and your employer's name. The names will not be published if you do not desire it.

We would like to have your ideas on the following features of commercial car service:

"What arrangement between employers and chauffeurs will insure the greatest motor truck service with the least expense?"

"Is it advisable to fine drivers for accidents and breakages, or to give rewards for freedom from accidents and trouble?"

"Is anything gained by making each driver responsible for the condition of his vehicle, and giving rewards for good condition or penalties for poor condition?"

"Does it pay to give a bonus for careful operation, or for largest number of deliveries or greatest ton mileage per dollar of cost of operation?"

"Is it necessary to limit mechanically the speed of trucks and to equip them with taximeters?"

Do not hesitate to give us your view on these or any other features of the service, which in your opinion can be improved.

\$5.00 will be paid each month for the best contribution received and \$3.00 a column will be paid for contributions published which do not win a prize.

In addition we will give a prize of \$25.00 to the contributor who wins the largest number of monthly prizes during the year, and a second prize of \$10.00 to the contributor who has the largest number of individual contributions inserted in this department during the year.

## The Baker Commercial Electrics

BY WILLIAM J. JOHNSON

Pre-eminent among the builders of electric commercial cars is the Baker Motor Vehicle Company, of Cleveland, Ohio, well-known as the exploiters of the Baker line of pleasure electric vehicles.

Three chassis are featured by the Baker Motor Vehicle Company, 1,000, 2,000 and 4,000 pounds load capacity. The 1,000 pound complete chassis sells for \$1,900, the 2,000 pound chassis for \$2,300 and the 4,000 pound chassis for \$3,100. All three vehicles follow the same construction, each class being built in accordance with the demands of the service for which it is designed, but the general design and the methods and processes involved in all three cars are the same. In all three cars a pressed steel frame is employed, the Exide type battery is suspended from the frame and retained in a cradle, a single motor is used, steering is from the left, final drive is through double side chains and the controller is of the continuous torque drum type.

Simplicity, it would appear, is the keynote of the Baker construction for, surely, the designer had this idea in mind when he laid out the cars. There appears to be nothing about any one of the three Baker chassis that is unnecessary and the construction throughout is standard and simple. For example, the battery may be removed from the cradle without the use of jacks or special equipment, a feature to be appreciated.

The sponsors of the Baker, The Baker Motor Vehicle Company, contend that they are building a line of unusual motor wagons. The best proof of the worth of the Baker cars, or, any other line for that matter, is the manner of the performance of those cars. There are many Baker trucks in service throughout the country, and, according to the builders, they are doing good work. Many vehicles of this make are in use in New York City, where, admittedly, service is perhaps harder than in any other portion of the country. The Baker trucks are the outcome of due consid-



Fig. 1. Baker Electric 2-Ton Truck.

eration of what is best and what is most essential in a thoroughly satisfactory electric vehicle for commercial use, and the cars of today are the results of the efforts that have been expended in the past with the ultimate view in mind of producing the best possible vehicle of its type. The Baker Com-

pany, like others engaged in the production of electric commercial cars, believes the electric to be the car best suited to general conditions so that, with this idea in mind, the

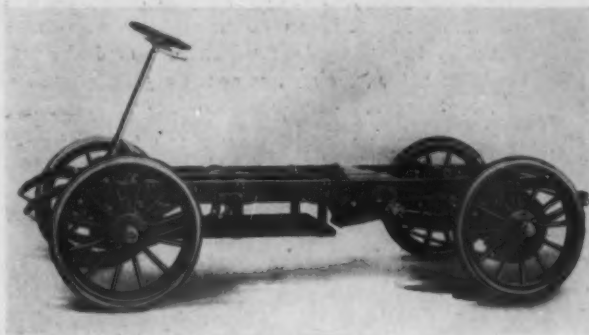


Fig. 2 Baker Electric 1-Ton Chassis.

makers may proceed with the development of what is already regarded as a very efficient car.

### Three Chassis

As mentioned in the foregoing text, The Baker Motor Vehicle Company are offering the public three chassis of a half, one ton and two tons load capacity. In all three vehicles the construction is identical save of course for increased weight and dimensions of the components in keeping with the greater work to be done by the heavier cars.

### Pressed Steel Frames

The builders of the Baker look to the steel frame as best meeting the demands of electric commercial car service and accordingly all three models are so equipped. The side members are straight throughout their length, curving at the front and rear for the reception of the spring bolts. There is that about the Baker steel chassis which is suggestive of strength without great weight.

Now then, since all three Baker models are built along the same lines, a description of the two ton chassis will best serve the purposes here. In this two ton frame the length is 188 inches and the width 42 inches and the channel section of the pressed steel side members is 5 inches. This frame is re-enforced by cross members and is braced at the corners, the assembly being hot riveted. The side members are deepest at the center at a point where the weight of the battery is a consideration. The lower lips recede gradually to the front and rear.

The wheels of this two ton truck, like those of the other two models are wood, artillery type provided with Timken roller bearings, the tires being 36 x 4 solid rubber forward and 36 x 2½ dual solid rubber rear. The tread is 62 inches and the wheel base 120 inches.

### Axles

It is not infrequently the case that the otherwise good design of a car is hampered by one feature that is out of harmony, and this is well set forth in the axle equipment of some cars. The designer of the Baker electric took no chances on



**Baker 1-Ton, Exp. Body.**

detracting from the general appearance of the Baker electric when he designed the axles. For the front member there is used an I-beam section steel forging with a drop center not unlike that featured on many pleasure cars. The harmonious effect of the whole forward end of the car is enhanced by this one little feature alone. The section of this member, forged with integral steering jaws provided with Timken bearings is  $3\frac{1}{2}$  inches.

For the rear axle a  $1\frac{3}{4} \times 2\frac{1}{2}$  inch forging is used.

**Baker 1-Ton, Panel Body.**

### Springs

The springs front and rear on the Baker two ton truck are semi-elliptic, 44 inches long and 3 inches wide, front members built of 11 plates, rear springs of 14 plates. Separate spring saddles or seats are used instead of forging these integral with the axle as common practice favors. On the rear axle the spring seats are shrunk to the axle while hot so that there is a tight fit. The whole assembly, seats and springs, is retained to the axle through the usual steel clips with heavy bolts. The disposition of the front spring assembly is along similar lines.

The springs are anchored to the frame in the usual manner. The front members are held at the frame ends forward and at the rear two cast steel shackle brackets, there being two flat steel side plates to form the link between the brackets and the spring eyes and thus allowing for free action as well as providing a simple means of suspension. These springs anchor brackets are riveted to the frame. The rear springs

are cared for in like manner, anchorage at the rear ends being to the frame ends.

### The Baker Power Plant

As mentioned above a single motor is employed in the Baker electric trucks. The consensus of opinion is that the single motor is preferable to dual equipment or otherwise and the Baker company are adherents to this theory. Obviously the single motor simplifies the power system to a degree. In all three models the motor is suspended from a hollow steel tube which extends from one frame side member to the other, this tube being anchored on each end in brackets bolted to the frame side members. The motor may be released from the retaining brackets on the motor casing or removal is simple by loosening the brackets on the frame sides, either way will accomplish the desired end. The motor is placed about  $\frac{3}{4}$  aft. In the two ton model the equipment is 4

h. p., series wound having a capacity of 300 per cent. overload. Forward of the motor is the jack shaft or counter shaft, the connection from the motor to this member being a Renold silent chain fully encased, this being oil and dust proof. The bearings on the motor and counter shaft are annular ball providing for a free and sweet action. To the outer ends of the counter shaft are secured the driving sprockets on the large car, these being of 16 teeth, the counter shaft being  $1\frac{1}{2}$  inches in diameter. The rear sprockets secured to the rear wheels

**Baker One-Half Ton Wagon with Delivery Body**

ing chains are  $1\frac{1}{4}$  pitch with rollers  $\frac{3}{4}$ -inches wide. The counter shaft is supported on the outer ends in brackets riveted to the frame side members. Radius rods are fitted, these extending from the jack shaft to the rear axle and supporting the entire brake assembly. There is the usual provision for adjustment so that to care for the chains is by no means a difficult task.

On the two ton model the Exide 42 cell 13 M. V. battery is used, this being carried in the cradle between the two forward cross members of the frame so that the battery extends from a point just aft of the front axle to a point just forward of the second cross member of the frame. This cradle is secured to the side members of the frame at six points so that the anchorage is positive.

#### Continuous Torque Controller

The controller is of the continuous torque drum type and is placed under the floor boards, and a small trap door is provided as means of access to the instrument. The resistance is placed to the left of the controller. The controller is worked by a horizontal finger lever placed under the steering wheel, this being fitted with a latch to lock the lever in the neutral position when the car is not in use, rotation of the drum being through two bronze bevel gears. The complete Baker two ton chassis with the battery weighs 4,500 pounds.

A salient feature of this power equipment is "quick detachability." The motor suspension as pointed out above is such as to provide a quick and simple means of removal, and since no special equipment is necessary to remove the battery from the car the owner of a Baker herein has two things to be thankful for, for they are conveniences of the sort that save time. To disconnect one battery or motor and substitute another saves time on a pinch, and time in business means dollars and cents and a profit or loss according as to how the emergency is met.

#### Brakes

There are two sets of brakes on the Baker two ton truck, one set on the rear wheels, the other on the counter shaft. The rear set worked through a foot pedal, conveniently placed, is of the internal expanding type, the whole assembly being supported on the rear ends of the radius rods, these rear members being 16 inches in diameter with a face of 3 inches. Steel pull bars, adjustable, are used and the braking action is equalized. The counter shaft brakes are worked by a foot pedal also. Brake levers are drop forged steel.

#### Steering

The left side control is now much more in evidence than in the past on commercial cars, since cars so controlled offer the operators various advantages not to be had if driven from the right. All Baker models are driven from the left side. The steering post of  $1\frac{3}{4}$ -inches diameter is raked sufficiently to assure a comfortable position for the driver and is equipped with a 16-inch hand wheel. The control lever or controller handle is just under the wheel and is easily reached by the fingers of the operator. The steering gear is of the bevel gear order, the bevels being housed in a dust proof case. The cross connection steering rods are carried forward of the front axle and are adjustable. The steering arms and other heavy connections are drop forged. With the steering post comfortably tilted back, brake pedals within

easy foot reach, and the controller lever under the steering wheel, the driver of a Baker electric is not hampered in the successful operation of the vehicle. A volt-ammeter placed on the left side of the dash affords knowledge of the state of the batteries and the current consumption.

#### Baker One-Half and One-Ton Models

While mention of the Baker two ton vehicle would generally approximate the one half and one ton models, citation here of the specifications of the two smaller vehicles will not be amiss. The wheel base of the smaller car is 85 inches, this being utilized generally as a delivery wagon, while the wheel base of the one ton model is 92 inches, though the gauge in both cases is identical, 56 inches. The smaller car is fitted with  $34 \times 3$  inch tires, the one ton model with  $34 \times 3\frac{1}{2}$ , solid or with pneumatics, Palmer web types, this latter equipment being used mostly in ambulance work where very easy riding without vibration is one of the chief requisites. The spring equipment, like in the large cars, is of semi-elliptic order and rear wheel brakes are also used. The motor of the one half ton model is of  $2\frac{1}{2}$  h. p., series wound, 300 per cent. overload capacity, while the one ton model is fitted



Fig. 6. Baker Electric 1-Ton with Express Body.

with a  $3\frac{1}{2}$  h. p. unit also of 300 per cent. overload capacity. The battery equipment in each car is 42 cells Exide 9 M. V., and the motor suspension as in the two ton car is of the quick detachable order, drive from motor to counter shaft being through a Renold silent chain fully enclosed in an oil and dust proof case. The one half ton car chassis with battery weighs 2,400 pounds, the one ton model 3,000 pounds.

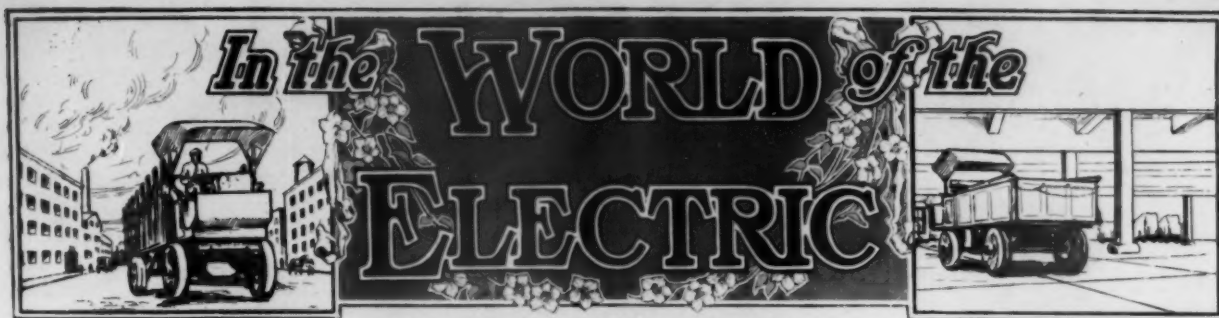
#### Bodies

The company furnish several types of bodies and are prepared to figure on equipment of every description, size or weight for their line of electric commercial cars. Equipped with an express wagon or panel side body the one half ton car sells for \$2,200, the one ton model for \$2,650; if fitted with the express wagon equipment or the plain platform or stake types side panel type \$2,800. The two ton truck fitted with platform stake or express wagon body sells at \$3,500.

#### Carrying Space

In the one-half ton model the carrying space is 76 inches long, 60 inches high and 42 inches wide. In the one ton model the carrying space is 90 inches long, 42 inches wide and 68 inches high; in the two ton model 150 inches long, 66 inches wide and 78 inches high.

The average radius of action on a single battery charge in Baker trucks is about 60 miles. As for speed the cars are geared in accordance with the service for which they are to be used. For example, an ambulance equipped with Palmer web pneumatic tires, ostensibly could be driven at a faster clip than could the same vehicle fitted with solid rubber tires.



CONDUCTED BY HARVEY ROBINSON

## Problems Involved in Advancing the Use of Electric Vehicles\*

WM. P. KENNEDY

Ten years of satisfactory service ought to be a sufficient period to instill reasonable confidence in the utility of a piece of machinery, particularly so if the gradual improvement of this machinery in the interval has not effected any radical departure from the original design. How, it may be asked, could the original design have become evolved in so practical a form as to leave little room for serious modification, and why, if its utility is so evidently demonstrated, does it not come into more general use? What procedure can be commended to accomplish the latter purpose?

An explanatory response to these apparently simple questions is the subject matter of this paper. \* \* \*

Prominent among the characteristics of our national genius is a faculty for commercializing upon the practical application of science, or of reducing to handy mechanism the novel enunciations of the laboratory, which in other countries serve only to inspire so much awe as to obstruct a perception and appreciation of their utility. \* \* \*

In no instance is our prowess in this direction more strongly exemplified than in the development of the electric vehicle. Scientific investigators have been perhaps more generally contributory in the several elements of this device than in any other common utility entrusted to the manipulation of unskilled operators. It is, in fact, a product of the scientific intellect so completely developed to comparative perfection that the question of what it is or how it works needs seldom concern those interested in its employment. \* \* \*

### Electrical Development

Immediately preceding the practical work at the beginning of the 19th century we are indebted to the classic scientific enunciations of Pascal, Newton, Lavoisier, Helmholtz and Berthelot, and more particularly Coulomb, Joule, Volta, Ampere, Ohm, Oersted and Faraday, covering the mechanics, physics and chemistry which we have utilized in the electric vehicle.

The 19th century brought with it the more practical applications of scientific knowledge, to which we are particularly indebted, notably in the efforts of Thomas Davenport, who invented the electric motor in 1834 and made application of it to electric traction purposes; to Pancinotte, Gramme, Siemens and Edison (1864-73) for sources of dynamic electric current;

and to Plante (1860), Faure (1880), and more recently, Edison, for the development of the electric storage battery.

Commencing with the incipient stages of electric traction in 1880, we are obligated to present-day engineers for the experimental development and exact data which were in our possession in 1895-6-7, when the manufacture of electric vehicles on an extended and varied scale was first undertaken in this country, and the every day example of the continued operation of the machines produced at that date verifies the stability of the engineering knowledge and wagon manufacturing art applied to the production of electric vehicles twelve or fifteen years ago.

### Introductory Progress

With most of the unknown quantities from an operating standpoint eliminated, it remained only to introduce these machines into the various lines of trade and commence to create a satisfactory impression of their reliability and prove their economy. This introductory work has since been in progress uninterruptedly, and while encumbered at the earlier stages with the skepticism which almost any innovation invites, there is no existing legitimate reason for doubt or question as to the possibilities of their extended employment. \* \* \*

The conduct of the propaganda necessary to introduce such numbers as are actually in service has called for a vast amount of patience and a great deal more perseverance than the casual observer might be able to discern, and notwithstanding the contemporaneous development and general employment of kindred or equally useful apparatus, such as the telephone and the street car, the problem has been encumbered with the feature that in most cases the employment of machines called for independent initiative on the part of the user, which is much more difficult to bring about than the collective or popular use as exemplified in the apparatus just mentioned.

In addition to this, there has been the further obstacle that the logical user of this form of apparatus has had the collateral encumbrance of investment in horse vehicles, which, however wasteful as compared with the new devices, have had the advantage of established custom and a heritage covering many centuries, which rooted them almost immovably in the habits of our commercial life.

Another influence tending to impede their more rapid introduction is due to the fact that there has been little co-operative effort on the part of those at interest to facilitate their employment. Manufacturers have been isolated by what

\*Extracts from paper read before the convention of the Electric Vehicle Association of America, Madison Square Garden, New York, October 18, 1910.



they believed to be their competitive interests, and the simultaneous development of gasoline passenger vehicles, instead of constituting an aid, has been an inadvertent obstacle in creating an expectancy in the minds of prospective merchant users that the commercial electric vehicle was of inferior development because of its slower speed and more limited radius of action.

### Advantages

The consideration of the utilitarian features of the machine and its superior practicability and economy over existing methods of transportation by muscular power and depending upon the uncertainties of animal life, will bring out in such remarkable contrast such superior advantages in favor of the machine as to evoke astonishment or surprise as to why its benefit should not be recognized and taken advantage of.

When we consider in this comparison that the employment of machines removes from the problem of city merchandise transportation, or distribution, detrimental uncertainties and expensive casualties, with which the employment of animals is constantly beset, the self-evident security would seem to demand an almost immediate exchange. To examine the machine further develops the possibility of a logical and rational employment of just that power equipment which may be necessary to effect any given service. The flexibility of this equipment has a wide range of variation, from that necessary to transport the lightest class of packages to the heaviest and most cumbersome freight. Any speed desirable can be previously arranged for, and any radius of action consistent with the working time available for the operation of the vehicle can be supplied with an exactitude with which no other form of vehicle can favorably compare. This regulation or selection of capacity of the device can be pre-determined by the most accurate and scientifically constructed instruments available in any of the mechanic arts, and that the cost of operation is almost in direct ratio to the work performed, and simultaneously subsides with inactivity, are the paramount issues upon which this type of machine demands and should be accorded universal recognition and employment.

Why, it may be asked, should not a device which is so commercially practicable and in such prevalent, if latent, demand, force itself upon the business community to the exclusion of all other devices intended to accomplish a similar purpose? To answer this question calls for an inquiry into the various elements in the situation which ought to be contributing factors to the execution of such a purpose.

### The Manufacturer's Burden

Heretofore almost the entire burden for the launching of a project of such scientific and practical magnitude has entirely rested upon the shoulders of the manufacturer, with the only justification that the speculative merits of the device thus put upon the market should command commensurate recognition and develop accordingly an enormous demand and a proportionate supply.

That this gigantic development has been of rather slow progress only enhances the supreme courage and confidence of these alert business men, who have not only had force enough to engage their capital in such a critical undertaking, but who have consistently pursued the project to date under the most tedious, if not discouraging, encumbrances. That the manufacturer bears the brunt of the problem is almost entirely lost

sight of by the prospective user, and it has been difficult to make him comprehend what is involved in the long period of development and experiment, with its consequent sacrifices, which must ensue before the perfected device is at all presented for purchase. The manufacturer has been expected to not only "hold the bag" up to this date, but further undertake the virtually ridiculous scheme of placing the vehicle in the user's service during a period necessary to bring about a conviction of the latter that his presentation is actually what he has represented it to be.

### Qualified Assistance

In the selection of qualified or skilled assistants to govern the design of machines to be developed and marketed, the manufacturer has further undertaken a risk, the scope of which may not become apparent until later in the progress of events. This refers to the difficulty encountered in selecting designers with sufficient maturity and experience in kindred lines to develop that breadth of view which is big enough to weigh up and decide upon the merits of scientific technicalities against reasonable commercial compromises, and we not infrequently see the development of cases where the limelight is fixed upon the supposititious, all pervading superiority of some minor technical detail to the exclusion of a liberal consideration of some broad commercial advantages.

### Pseudo Scientific Subtleties

The pernicious influence of this species of talent often pervades detrimentally the province of commercializing the product, which in reality ought to be consistently free from such trivialities in favor of the dominating advantages attending the use of the machine as a whole, but such is the persistence of this form of human vanity that the cue is readily taken up by improperly informed salesmen, and we occasionally encounter the spectacle of a prospective purchaser under the influence of this mysticism, juggling with the scientific principles of some inconspicuous or non-essential detail, to the detriment of a broader consideration of the time and money saving advantages of the machine as a whole.

### Educational Aids

The next working factor in the scheme is the influence of instructive literature, and until recently this has largely been void of that non-technical information essential to a proper comprehension of the subject by the average business merchant. We must admit that the class of literature abroad is either a picture book of glittering generalities, or scientific dissertations on the art of machine design. What the situation really needs is a wholesome, broad-minded treatment of the subject, generated with that educational faculty which will bring home to the prospective user the fundamental essential consideration which will remove every possible doubt as to the serviceability and economy of machine use and will influence irresistibly an immediate change from the old to the new method of transportation.

### Pleasure Vehicle Influence

The electric pleasure vehicle, the use of which has been constantly on the increase for the last fifteen years, and is now thoroughly established, can be utilized most effectively as the precursor of the commercial vehicle when intelligently introduced into the merchant's family, as illustrating to him the ready usefulness, simplicity and insignificant cost of operation.

### Salesmanship

Salesmen and salesmanship is even more of an elusive subject than any of the foregoing, and comprehensive treatment of the subject would demand far greater space than the present occasion will afford. It may be stated, however, that in this particular field of commerce some of the well-established rules prevailing elsewhere crumble to pieces in this case, and the established type of Trade Herald, with a gift of loquacity, engaging personality, and the faculty for separating money from its previous owners, is not always the type which succeeds in this exceptional province of business. The necessities of the situation seem to demand men with a reasonable knowledge of technical principles, and desirably having a manual familiarity with electrical mechanism. Those previously engaged in the sale of industrial power appliances offer the best material, but an educational faculty for impressing convincingly the average man of business with the essential advantages of the machine in contrast with his horse vehicles in current use, and an explanatory ability to make evident the changes desirable to afford the machine scope for economy, is of real and practical value.

### Psychological Considerations

While the ability to convince the prospective user must necessarily carry with it a high degree of self-confidence in the matter of handling the subject, caution should be exercised to avoid that species of enthusiasm which carries with it any evidence of bluff. The transaction, from the customer's viewpoint, is one of vital business consideration, and the doubt which is responsible for his hesitancy is sometimes caused by that lack of self-assurance in making a radical change in the method of his business, which is due to his unfamiliarity with the possible ability of the new devices. The mental struggle which he encounters in coming to a decision is not usually at this date influenced by a lack of confidence in the ability of the machine to perform his work, but is practically the same cautious hesitancy which is generated at almost every new departure in business, fostered by an unconscious disposition to be shrewd and conservative, rather than invite risks, which are unquestionably a new addition to his burdens in business.

The same man who will purchase for his own personal convenience or the pleasurable recreation of his family a luxurious and expensive touring car, will hesitate with the most aggravating persistence in arriving at a decision to make a much smaller investment in the province of his business. Therefore, the real germ to be cultivated in the salesman is an appreciation of the difficulties of mental conflict just described, together with a masterly domination by that force of superior will power which will practically compel a decision in his favor.

That type of educational persuasiveness which carries with it a consciousness of mutual benefit and a united interest from the transaction is more likely to be assimilated by the most austere of merchants, rather than any effort or inclination to surround the argument with scientific mysticism or competitive contrasts. Comparisons are odious on the best of occasions, but in the subtleties of such a situation as exists in making a decision on a new venture, they are not only

dangerous, but frequently fatal, and tend to shatter to pieces the confidence which may have been built up by the most laborious and persistent patience.

Lucidity is the result of methodical exposition, and simplicity of expression is never more valuable than when employed in reducing the complex within the scope of the average mind.

The task is an extremely difficult one and calls for ability of a very superior order. When we recognize the complicated and expensive organizations which have proved necessary by experience to market much simpler devices, such as typewriters, adding machines, cash registers and minor electrical appliances, where the project of their introduction is only effected by the co-operative work of a vast collection of varied and persuasive artifices, we recognize the magnitude of the task which often devolves upon the genius of a few or a solitary salesman employed by each of the electric vehicle manufacturers to advance the use of machines which are commercial apparatus of a much more comprehensive and expensive nature.

### Co-operative Potentialities

Due credit should be given to those manufacturers of essential auxiliary electrical apparatus for the part which they have played in the scheme to date, but that a more harmonious and collective effort is quite possible, with less expenditure, has been frequently made evident by the number of co-operative schemes for advancement recently proposed, but not yet put into very broad execution.

The result of our long and persistent effort to awaken the central stations to the realization of the very important and profitable share which they should take in this propaganda, is at last culminated in the organization of this association, but it remains for earnest and deliberate consideration to evolve such practicable, extensive and effective plans of operation as will precipitate the gigantic development reasonably within our expectations. \* \* \*

To realize the strength of the forces in opposition to our program is as essential as a knowledge of the strength of the enemy in any other conflict, and we might as well realize at the incipency of our plan of attack that the greatest obstacle is that human prejudice, or mental obliquity, which is ever in force to resist a change of state. All innovation has been confronted with the same resistance, and every age has been replete with instances of antagonism which, although they may be later considered ridiculous, must necessarily at the moment be reckoned with as of vital importance. Effort, though perhaps feeble, has been exerted in an almost infinite variety of ways to make known to the prospective user the benefits certain to come with the employment of the new methods we advocate, and almost infinitely varied have been the ways and means by which these efforts have been counteracted.

Skepticism, prejudices or apathy from the very subtleties of their nature have been the most difficult to overcome, and it remains for the concentration of our collective mentality, greater now than ever before available, to unite in one grand galaxy of effort to execute with determination a program which will be as irresistible as it may be comprehensive.





## Knowledge of Truck Construction Not Necessary

### TEAMSTERS AS DRIVERS

One phase of commercial vehicle usage, which has commanded much thought and consideration, is the question of drivers. Some hold that an experienced mechanic only should be trusted with a power vehicle, others point out that this is not essential and offer as support of their opinions the fact that coachmen, who have long been in a particular family, have been put at the wheel when the house finally acquired an automobile. In a sense, the same policy has been pursued in the commercial field. Some firms pay drivers fairly good wages and employ only those who have had some previous experience on pleasure cars assuming that the experience thus gained will be useful in the business field. But, be that as it may, the fact remains that many drivers of commercial vehicles to-day are men of no previous experience whatsoever, and who for the most part have no particular knowledge of motor vehicle construction. It would appear that, with electric cars such a condition of affairs might result satisfactorily, since in operation and control there is but little to be done and no great skill is required to advance from one speed to another or reverse, as the case may be.

One good illustration of the success in service of cars, manned by men who have had no previous training, is the case of the United Dressed Beef Company, of New York, whose drivers have all been advanced from the grade of teamster to vehicle driver as soon as commercial cars went into service. As pointed out elsewhere in this issue, one of the very best drivers in the employ of this concern is a man over 60 years of age, who has long been in the service of the concern as a teamster. He was put in charge of the first gas truck. It is said that he knows the situation very well, more especially as he has been with the same concern for many years and is familiar with the delivery service. All the other drivers were formerly teamsters, so that inasmuch as horses are still used by the concern the men may be regarded as doubly useful. It is the contention of this concern that this method of doing things is most satisfactory and the vehicles are perhaps better treated than if the so-called chauffeurs were employed. At any rate, repairs are held down to a minimum and with the commercial car equipment things are done now in the way of delivery that previously would have required the services of the railroad company, and these same teamsters have to make the runs to and from the given point. From this experience it would appear that good service is not necessarily dependent upon the employment of an expert chauffeur. In fact, most concerns of to-day having trouble on the road are equipped to send another vehicle on the spot in short or-

der. Drivers with the better houses do not do the repair work, but are simply what might be called "runners."

The driver situation at the Peter Doelger Brewery, New York, is about on a par with that of the United Dressed Beef Company, for here also are the drivers of the seven electric five-ton trucks old employees of the house who have been advanced to the charge of the commercial electrics after long serving as teamsters. These fellows get along very nicely. The Doelger interests might be called exclusive, in that they do everything themselves, with their own men. The scheme here has worked out very well, so it is said. And the foregoing are but two instances of where this sort of thing is done. The contention is by no means general that a man not versed in mechanics and the intricacies of gas engine construction is a fit person to be placed in charge of a five-ton vehicle which represents quite an investment. But it takes all kinds of people to make a world and the sort above mentioned are doing very nicely, so that, there must be a reason and that reason is nothing more or less than a little common sense exercised by the men in charge of the cars. For a given operation in the control of a gas or electric truck a given result is pretty sure to follow, so that it can hardly be regarded as beyond mastery for anyone but the fellow of natural mechanical bent.

### EXAMPLES OF MOTOR TRUCK WORK

An example of what might be called cross country truck service was furnished in Detroit recently when a commercial car transported the household goods of a family from Ypsilanti to Detroit, a distance of thirty-two miles.

The truck made the journey through sandy roads in three hours and five minutes. The total expense was \$7.50, divided as follows: Driver's salary, \$2.75; helper's, \$2; fuel, \$1.50; depreciation and interest on the investment, \$1.50.

By a team of horses it would have taken two days and the expense would have been three times as great; by freight, twice as costly and six days' time. The goods arrived in good shape. There were fewer handlings and less time on the road than by either horse or freight train.

Among other noteworthy performances of the motor truck is that of the Kansas City (Mo.) truck that delivered two loads of alfalfa, aggregating 11,240 pounds for a total distance of 21 miles, while a four horse vehicle made one trip of 10 miles with a load of 7,700 pounds.



### SOME HANDLING HINTS

While, due to the endeavor to produce a machine that the ordinary horse driver can handle, commercial cars are constantly becoming more simplified in operation, and more and more of their parts are achieving practical "foolproofness," it cannot be too greatly emphasized that in operating a commercial car it is not sufficient that it be kept running and able to carry its load, but that it must also do so with the greatest possible efficiency. Too many drivers seem to consider that because a commercial car is moved by "machinery" and not by horses, there is no such thing as abuse, and that any handling of the commercial car, provided it is not followed by an immediate breakage, is permissible. After damage becomes apparent following continued abuse, the driver does not realize his misuse as the cause, nor will he report the real cause even should he see it, but lays the blame on a fault in construction—which the owner accepts. One of the most common causes of trouble is overloading, which puts a greater strain on the entire machine, from the frame and springs to the motor, than it is designed to withstand. A trip under a heavy overload will do more towards laying a commercial car up in the repair shop for extensive repairs than a year of continuous service in proper hands. Overspeeding is another prolific cause of repairs, drivers with a speed mania trying to see how fast they can go. Some have been heard to relate how they put the speed governor out of commission and drove down hill under "full power" at 30 miles an hour, to gain momentum for attacking the ascent of the next hill. The way the engine labored near the top, and how it "took 'er over, all right," is described with much gusto, and pride of skill (?) in operation and of the car's performance. Here is a typical case of two abuses, overspeeding and racing of engine. The latter sets up excessive vibration which does more harm in a few minutes than can be done in weeks of careful handling. Not only are nuts and bolts loosened, but the vibration is such that it changes the internal structure of the metal of the various parts, producing crystallization and so weakening the parts that fractures result from comparatively small loads upon them.

The clutch is a part of the mechanism which should be carefully operated. Sudden jamming in of the clutch not only starts the car with a disagreeable jerk, but puts a terrific strain upon all parts, from the tires to the crank shaft. The frame is strained, gears and sprockets threatened with stripping, shafting with breakage. This habit sooner or later leads to serious damage of some essential part, to say nothing of the general rapid deterioration of the whole machine. The clutch should be engaged gradually at first, the amount of slip becoming less and less as the motor and parts take up the load, and the car attains momentum, when the clutch may engage positively.

Sudden stopping is, like too quick starting, also to be condemned. While the strain is not upon the motor, nor sprockets and chains unless the brake is located on the jack shaft, tires, wheels and frame suffer through being forced to take the entire weight of the machine with the momentum it has gained. When the brake is located on the jack shaft as well as the rear wheels, the strain upon the sprockets, chains, shafts, keys, pins and differential are excessively severe. Brakes should be applied gently and carefully, slackening the speed of the car as quickly as possible without locking the wheels. Locked wheels slide upon the ground with less retarding effect than wheels which are revolving against

the maximum braking effect which will permit them to revolve. In addition, locked wheels often cause loss of control and accidents through skidding.

Another point in stopping is that the car should never be stopped no matter from how small a speed, by collision with the curb or platform. The resulting shock is detrimental and from loosening the motor supports to cracking panel bodies its effects may be seen.

Lubrication is important, for lack of proper lubrication not only absorbs power, but by wearing bearings continually increases the power consumption and runs up a formidable bill of expense. Many trucks are provided with an automatic system which lubricates bearings without attention, but this system should be carefully gone over occasionally, to see that it is working properly without stoppage in the leads, and that all bearings are receiving the proper amount of oil. It is just as important that chains should be kept well lubricated and clean, as otherwise they also consume power, rattle and wear out. They should be removed about once in every thousand miles, washed in kerosene, and then boiled in tallow and graphite, after which they should be hung up, the superfluous grease being scraped off when cool. This mixture of tallow and graphite thoroughly covers all parts of the chain, keeps out dust and dirt, and by lubricating thoroughly all bearing surfaces, adds much to the life and efficiency of the chain.

Collisions occasionally bend the front axle or steering arm without it being noticed. This, however, causes the front wheels to run at an angle to each other, with the result that they offer an appreciable resistance, due to the different paths which the wheels are trying to take and the consequent friction between the tire and road. This friction is also obviously destructive to a tire. After a collision with another vehicle or even with the curb, the wheels involved should be carefully tested to see that they run true.

### SOME CREDITABLE COMMERCIAL CAR PERFORMANCES

THE MOSLER SAFE CO., of New York, recently decided to test its new five-ton truck, appointing impartial critics to time the machine's performance. The result was that it was shown that using the commercial car, a safe was loaded, delivered and placed in position in one fourth the time it took the team of horses formerly used. One of the features of the car, and which did much to lower the time is a windlass operated by the motor of the truck.

A test lasting a whole day was recently made by the Quincy Quarry Co., of Quincy, Mass., which company wanted to know how much its four-ton truck could do in ten hours. The result surprised even the most sanguine. The truck hauled twelve loads from the quarries to various yards in and about Quincy. It returned after each delivery to the quarry. It delivered an aggregate of 106,400 pounds, or 53 1-5 tons that day. The smallest load was 7,900 pounds, the largest 11,000 pounds. Sixty miles were traversed. Some of the territory the truck pulled over was rough and hilly and it would have required eight horses to haul the load. It would have taken a team of horses four days to perform that task. The expenses in gasoline, lubricating oil and driver's salary for the day were only \$5. The additional cost in interest and depreciations was \$8.50.



### COMMERCIAL CAR VICTORIOUS IN TWO TESTS

Two tests of a particularly interesting nature have recently been made by the Breisch Milling Company, of New York, using a Reo motor truck, and, as reported by the local agents of the car, R. M. Owen & Co., furnish valuable data for comparisons of horse drawn vehicle and power truck delivery service. On the figures submitted the case was overwhelmingly in favor of the power wagon, from several points of economy.

The first test covered eighty-eight consecutive working days in the months of October, November, December and January. The second consisted of an eighteen day test in which a horse and a Model H Reo motor truck were used side by side for eighteen consecutive working days in the delivery of flour to the trade. During the four months the Reo truck made 2,171 deliveries in 621 hours, aggregating 925,623 pounds, which is an average of less than seventeen minutes per delivery, 25 deliveries per day and 426 pounds for each delivery. In the four months there were 2,784 miles covered, which is an average of nearly a mile for each delivery. There were used 290 gallons of gasoline and 25½ gallons of oil, the cost of which averaged two cents per mile delivery of 426 pounds each.

In the eighteen day Reo truck and horse test the truck made 418 deliveries in 114 hours, covering 560 miles at a total cost of \$8.76, or an average cost of two cents per delivery, whereas the horse made only 132 deliveries in 133 hours, covering 110 miles at a total cost of \$7.49, or an average cost of nearly six cents for each delivery.

### A GOOD SHOWING

A four cylinder Daimler truck during the snowy spell in New York in February took out in the course of a demonstration, 100,690 pounds of beef in ten loads, the distance covered being over 400 miles. The gasoline consumption for this distance was 75 gallons with an average of 5 1-3 miles to the gallon. Two of these days the vehicle was being demonstrated the roads were unbroken and the car had to make its own way through the snow, which it did very successfully with a full load on. The longest trip in the course of this demonstration period was 80 miles through Maramoneck, Rye, White Plains and the Westchester county section. On this occasion the vehicle carried 12,800 lbs. load. This same car also transported 218 half barrels of beer in five trips in three days. Each barrel carried weighed 200 pounds and the gasoline consumption on this test was 35 gallons.

### MORGAN UPKEEP SYSTEM

The R. L. Morgan Co., of Worcester, Mass., in selling its commercial cars emphasizes the necessity for the proper organization and system in utilizing the equipment. Clair Foster, President of the company, states:

"My experience has taught me the absolute necessity of systematizing in order to get the best results from a motor truck. Many concerns have every other department of their business thoroughly systematized, but neglect that of transportation of their merchandise to and from the warehouses.

"When one of our dealers sells one or more trucks to a merchant we send a list of questions which we have compiled for the proposed drivers to answer. It is very essential that the drivers of the truck should know what to do and how to do it; and if the answers to these questions are unsatisfactory we take steps to instruct the driver in the proper care of the machines. We also have a report blank which the driver of the truck is expected to make out once a week, and that will tell the merchant at all times the exact condition of the machine.

"If the best results are to be obtained it is also necessary that a complete line of duplicate parts be kept in a well ordered stockroom under the care of a responsible stock clerk—that is, in case there are several machines at work."

### UTILIZES DISPLACED HORSE TRUCKS

When a large lumber firm in St. Louis decided to replace its horse equipment with six commercial cars, the president of the company saw possibilities in the 24 horse truck which were displaced. These and one team of horses were kept instead of being sold, and used somewhat similarly to the Wanamaker loading body.

While the motor trucks are out delivering lumber, the horse trucks are being loaded at the yard. Upon the arrival of the empty motor truck a load is transferred from a horse truck, the complete operation being accomplished in three minutes, a five or six ton load being transferred in that time. Both trucks are fitted with rollers with cranks, to transfer the load, which is, of course, firmly bound together before being moved from one truck to another.

An Electric Lighting Company of Dayton, Ohio, is operating a 1,000 lb. electric car fitted with a powerful searchlight by means of which a repairman can work to advantage at the top of a fifty-foot pole. This wagon is used day and night.

## COMMERCIAL CARS IN PITTSBURG

Although Pittsburg, Pa., and vicinity is of peculiar geographical and topographical construction, which renders haulage of either kind more difficult and expensive than in flat territory, commercial motor trucks are in use there in large numbers. The big department stores possess more than the smaller dealers and are better qualified to render opinions, a few from some of the leading users being presented below.

The Joseph Horne Company keeps 23 motor trucks or wagons in constant commission for the delivering of goods. Twenty are of the one-ton type and the other three are one and a half ton trucks. Four makes are in use.

M. S. Thompson, manager of the motor truck delivery department, stated that while the 23 trucks and wagons form, on an average, a larger item of expense than as many horse-drawn vehicles, they do practically twice the work.

"Horne's have been using motor vehicles for seven years," said Mr. Thompson, "but it has only been within the past few years that they have come into general use. More cars were added until at present we have 23 in service, and I can say that the efficiency of the delivery department has increased 100 per cent."

G. L. McCullough, manager of the delivery department of McCreery X Company, who has made a study of the results of the introduction of the auto truck delivery service in his department, at this busy store said:

"Our experience with the cars that we have had in operation for a year, has been thoroughly satisfactory, and it is my belief that within the very near future the automobile will be the sole means of city and suburban delivery."

Edgar Kaufmann, of Kaufmann Brothers, was highly complimentary of the automobile in commercial delivery service. The Kaufmanns are operating eight commercial cars to great advantage.

"In the four months' time we have been using the machines," said Mr. Kaufmann, "they have proven very satisfactory. We first purchased two cars for a try-out and the balance on finding them successful.

"They are costing less than the use of horses and the maintenance of stables. Each car is replacing two horse-drawn vehicles and making better time at it. The autos are proving especially satisfactory in the out-of-town deliveries."

J. W. Blake, superintendent of Rosenbaum's store, praised the big White truck being used in his delivery service as the first experiment in auto delivery by his firm.

"We have had the car but a short time," said Mr. Blake, "but it has been doing very well, indeed, I think there can be no question but that the auto truck is the only future delivery vehicle. It covers the ground, carries heavy loads and is certainly more humane. It will not be long, in my opinion,

until automobiles generally take the place of horses in delivering goods. The automobile is the up-to-date form of delivery."

## COMMERCIAL CAR MOVES PLANT

Only a short time ago the White Sewing Machine Company had to move its factory equipment to its new home, on Seventy-Ninth street, Cleveland. With a concern of this kind the problem is a serious one, because the daily output is large and to stop producing machines would be fatal to the business, and so the problem was presented of moving the plant without loss of production. In this instance again the utility of the commercial car was demonstrated and the following plan was therefore tried and proved successful.

Each department of the factory was moved as a unit, set up, and put into operation in its new home before disturbing another unit. By the use of two White three-ton trucks it was made possible to move each unit the five miles necessary with a loss of three hours' time. As a result, the entire factory was moved with the average loss of three hours' time in each department, and not a single shipment was missed nor order lost because of the removal—a record probably unequalled in the history of American manufacture. An entire plant was moved fully five miles with comparatively no loss of time.

Without motor trucks such a result would have been absolutely impossible. Orders would have been lost and the plant disorganized for weeks, and possibly months, under any other system; but the speed of the trucks, combined with the fact that the lathes and special machinery for building sewing machines are individually comparatively light, permitted the company to move the units in from one to two trips of the two trucks with a speed that could never have been equalled by horse drawn vehicles, and then the work was kept up day after day with the two trucks, not missing an hour when wanted.

## TRUCK MAKES GOOD THROUGH SNOW

Express service with a Packard truck is being conducted between Philadelphia and Paulsboro, N. J., by C. C. Thompson, of the latter place. A farmer living on the route gave Mr. Thompson a contract to haul a load of potatoes to the Philadelphia market, about 15 miles. An hour before the truck started, however, he sent a team to town with another load, as he was somewhat skeptical of the truck's ability to get through the snow drifts.

The result was that the truck got through on schedule time and delivered its load, while the team was hung up on the road on account of snow drifts that did not affect the truck.





## Some Interesting Examples of Coal Delivery by Motor Trucks in New York City

Progress is the order of the age, all who would remain in the procession must realize this fact sooner or later. The commercial car is a messenger of progress, it can be used to advantage for every service for which horses are employed, do the work better, in the long run cheaper, and on the whole much more satisfactorily. A well cared for motor truck can be worked 24 hours a day and this is being done every day in the week by some of the large concerns in New York City engaged in one line of business or another. To duplicate the service with horses would require two shifts of the animals and in winter, especially, the service, according to expressions of those now employing horses, could not be as satisfactory.

One of the most interesting uses made of commercial trucks is for the delivery of coal. This is rather a busy time for the coal merchants who are keen sighted enough to realize the utility of the motor truck for their especial class of service.

It is now quite a common sight to see coal thus delivered in New York City, in fact, the service is becoming more general day by day throughout the country. To those interested in up-to-date methods of transportation the service established by Burns Brothers and Curtiss-Blaisdell, of New York, will be of more than passing note. Both of these concerns employ a fleet of cars for coal delivery and both make the statement that the service is very satisfactory and more efficient than horse equipment, though horses are still in use by both concerns and likely to be for some time to come. Sufficient cars are in use, however, to prove conclusively that the motor tractor is the better agent when it comes to hauling heavy loads for long distances.

### A Novel Coal Wagon

Both of the firms mentioned above are using different makes of cars so that the results derived are the more interesting. Curtiss-Blaisdell employ in their coal delivery service four couple gear trucks and these are rather novel vehicles since the whole load of coal is carried in an ordinary coal wagon body which is secured to the couple gear tractor. In this couple gear outfit all four wheels are used for propulsion and for steering. A four cylinder, four cycle, gasoline motor is mounted forward under the floor boards in the usual manner, this being connected to a generator which generates current used by the four motors, there being a motor enclosed within each of the four wheels. It is claimed for this system of propulsion that it can be used to advantage anywhere, under all road conditions where other systems fail. In the Curtiss-Blaisdell cars the four wheels of this couple gear type

chassis are closed together so that they form a tractor much the same as does a locomotive, the trailing coal tender might be likened to the coal body of the balance of the equipment. The last vehicle of this type installed by the Curtiss-Blaisdell outfit has a capacity slightly in excess of nine tons. The firm employ three smaller couple gear trucks, one being of 6½ tons, another of 7¼ tons and the third of 8 tons load capacity. Obviously to transport such loads would require a vast amount of horse energy. A five ton Morgan gas truck and a five ton General Vehicle electric truck are also used.

Curtiss-Blaisdell have a chain of coal pockets about Manhattan, and the gas cars are all stored at the garage on East 55th street. Some of the coal pockets are hard of approach, being on the river bank and reached only by a difficult incline. It is claimed that with these couple gear trucks no difficulty is experienced in pulling out with a load regardless of the road conditions. The firm does a big business and obviously the cars are on the move pretty much all the time throughout the day.

The largest of these gas cars will transport about 1600 tons a month and the smaller vehicles will easily do 1200 tons a month, so that it is plain the cars are very useful and efficient for this particular service. In the case of long hauls the vehicles may be depended upon to get to their destination and back in less time than would be required for horses and incidentally they transport many times the load.

### 10 Ton Truck used by Burns Brothers

In the service of Burns Brothers, commercial cars are doing very satisfactory work. Thirteen cars are in use, 11 of these being Hewitt ten ton trucks, the other two, seven-ton Mack vehicles. The firm is one of the largest in the business in Manhattan and, as above stated, has yards or coal pockets scattered about the city, the cars drawing their supply from these widely separated stations. They average each about nine trips a day and the loads carried aggregate about 93 tons, though it is estimated that some of the cars carry 100 tons of coal a day. In the rush season it is imperative that the coal be moved promptly and for this reason much work is done at night.

### Operate Successfully in Snow

It is claimed that snow does not interfere at all with the work of the trucks, that they are able to get about when other vehicles of traffic find it somewhat difficult. There was a fitting illustration of this fact in New York city a few days ago. A Burns truck, heavily laden, was coming down through



Seventh avenue and was about to cross into West 41st street. At that point, two double horse coal teams, both loaded and bound in opposite directions, were helpless because of the snow and the slippery condition of the pavement. While the drivers of the horse trucks were hesitating, the minutes were being ticked off by the clock and the big gas truck, finding the road thus blocked, simply backed out into the avenue again and proceeded on its way without losing a minute.

### Daily Mileage and Cost

The average daily mileage of a Burns truck is between 30 and 40 miles the average consumption of gasoline 13 1-3 gallons and oil used about 1 1/4 gallons. Burns Brothers figure depreciation rather high, by reason of the fact that much night work is done with the vehicles. The cost of coal delivery is about 20 cents per ton mile within an average of two miles from the yard. On a daily average sheet covering the entire fleet for several months, depreciation and interest were figured at \$6.17 a day, garage at \$35 a month or \$1.17 a day; gasoline, \$1.95 a day; oil \$0.56; driver \$3.39; set aside for tires and repairs, \$5 a day, which brings the total cost of operation up to \$18.24 per day. Tires last approximately 9 months, that is 7 1/2 calendar months including two months of night work, which was equivalent to nine months of actual service. It is estimated that the saving of these trucks over horse delivery is about 30 per cent. in the summer, and about 50 per cent in the winter.

These figures are interesting as it is stated on good authority that New York coal merchants not employing commercial cars are perfectly willing to pay 30 cents per ton for delivery of coal in good weather, while for winter delivery the price runs up to 50 cents per ton. With commercial cars able to navigate in heavy weather when horses are at a distinct disadvantage, due to slippery pavements and kindred causes, it follows that the modern way has everything to commend it.

### Use Trained Drivers

On the Burns trucks the operation is left to men who are familiar with the construction of the vehicles, who have a knowledge of gas engine practice. The vehicles are fitted with a quick unloading type of body. Once the driver has his load aboard he has simply to proceed to his destination, release a trap and the coal is passed along a chute in the usual manner.

The appended schedule is that showing the work of one of the Burns trucks, and is said to be fairly representative of the accomplishments of the fleet in general. Ten hours constitute a day's work when the vehicles are operated during the day only. It will be noted that under this schedule the daily average mileage is 35.4 miles. The weight of this particular car empty was 13,000 pounds, the average weight of load 20,250 pounds, and the average rolling load is figured at 23,125 pounds.

"Hewitt" 10-ton Truck owned by Burns Bros., New York. Fourth Month of Operation. Tires in excellent condition. No delays, no loads missed in 4 months. Car in excellent condition. Base—38th St. and North River. Loads—Average weight, 20,250 lbs.

| Date.   | Loads. | Gas Gals. | Address.                   | Day's Mileage | Total Distance. |
|---------|--------|-----------|----------------------------|---------------|-----------------|
| Oct. 13 | 1      | 12        | 81st St. and Columbus Ave. | 37.0          | 5.5             |
| Oct. 13 | 2      |           | 80th St. and West End Ave. |               | 10.0            |
| Oct. 13 | 1      |           | 23d St. and 6th Ave.       |               | 3.5             |
| Oct. 13 | 4      |           | 18th St. and 6th Ave.      |               | 18.0            |
| Oct. 14 | 1      | 8         | 81st St. and West End Ave. | 37.0          | 5.5             |
| Oct. 14 | 7      |           | 18th St. and 6th Ave.      |               | 31.5            |
| Oct. 15 | 1      | 10        | 81st St. and West End Ave. | 38.0          | 5.5             |
| Oct. 15 | 1      |           | 81st and Columbus Ave.     |               | 5.5             |
| Oct. 15 | 6      |           | 18th St. and 6th Ave.      |               | 27.0            |
| Oct. 16 | 5      | 12        | 18th St. and 6th Ave.      | 34.0          | 22.5            |
| Oct. 16 | 1      |           | 81st St. and Columbus Ave. |               | 5.5             |
| Oct. 16 | 1      |           | 44th St. and 6th Ave.      |               | 3.0             |
| Oct. 16 | 1      |           | 44th St. and 6th Ave.      |               | 3.0             |
| Oct. 18 | 1      | 12        | 81st St. and West End Ave. | 36.5          | 5.5             |
| Oct. 18 | 1      |           | 73d St. and West End Ave.  |               | 4.0             |
| Oct. 18 | 6      |           | 18th St. and 6th Ave.      |               | 27.0            |
| Oct. 19 | 2      | 15        | 50th St. and 7th Ave.      | 36.5          | 7.0             |
| Oct. 19 | 3      |           | 18th St. and 6th Ave.      |               | 13.5            |
| Oct. 19 | 4      |           | 22d St. and 6th Ave.       |               | 16.0            |

Average from October 13th to October 27th.

|                                                |              |
|------------------------------------------------|--------------|
| Average miles per day.....                     | 35.4         |
| Average gallons gasoline per day .....         | 11.9         |
| Average miles per gallon .....                 | 2.97         |
| Average number of loads per day .....          | 8.3          |
| Average tons per day .....                     | 84.03        |
| Total tons in 13 days .....                    | 1,092.39     |
| Total pounds in 13 days .....                  | 2,184,640.00 |
| Cost per day (maximum) .....                   | \$16.00      |
| Cost per ton .....                             | .19          |
| Average miles from base .....                  | 2.13         |
| Weight of car, empty .....                     | 13,000 lbs.  |
| Average weight of load .....                   | 20,250 lbs.  |
| Total weight .....                             | 23,250 lbs.  |
| Average rolling load .....                     | 23,125 lbs.  |
| Average ton miles per gallon of gasoline ..... | 34.43        |

Records Received from Burns Bros.—December 20th, 1909.

| Mnth.  | Work Days. | Loads. | Loads per day. | Total Gal. Gas Tons. | Gal. Oil Tons. |
|--------|------------|--------|----------------|----------------------|----------------|
| Sep.   | 12         | 62     | 5.16           |                      |                |
| Oct.   | 25         | 185    | 7.40           |                      |                |
| Nov.   | 22.5       | 185    | 8.25           | 1837                 | 12 .57         |
| Dec.   | 17         | 140    | 8.23           |                      |                |
| Total. | 96.5       | 572    |                |                      |                |

Average tons per day for 96.5 days .....59.2  
Average tons for Nov. and Dec. (to Dec. 20th) 49.5 days....82.28

### Daily Running Cost.

|                           |        |
|---------------------------|--------|
| Wages, Driver .....       | \$4.16 |
| Wages, Helper .....       | 2.00   |
| 12 Gal. Gas, at 10c. .... | 1.20   |
| 1/2 Gal. Oil, 28c. ....   | .14    |
| Storage, \$35 month ..... | 1.40   |
|                           | \$8.90 |

### Repairs and Supplies.

1 Pair of Chains .....\$42.00  
January 1st—Tires in fair condition; will certainly go 9 months and probably more.

Car in excellent condition.



# TRUCK ACCESSORIES AND APPLIANCES

## A Résumé of Commercial Vehicle Tires

All of the leading tire makers are now devoting much time and money on the development of tires suited especially for commercial purposes. Many styles are offered, both in pneumatic and solid type. While the use of the former is almost as desirable for commercial cars as for pleasure vehicles, still their use is prohibitive in most instances on account of very heavy loads. In connection with ambulances and public service vehicles, pneumatics are essential, as with vehicles of this type speed is the prime factor. By using two pneumatic tires on a single rim the makers have partly overcome the difficulty. The pneumatic twins do not differ in construction from the regular pleasure tires with the exception of the dual feature. These tires are being made by most all of the pneumatic tire makers. As the prime factor in securing the longest and best service from tires of all types, is the promotion of overloading, it is essential that all owners of commercial cars should know what loads are efficiently carried by the different sizes of tires.

The manufacturers of these cars usually place large enough tires on their cars to carry the loads they are rated to carry, but it is often the case that a truck will be loaded beyond its rated carrying capacity by 50 per cent. or more and the tires will not stand overloading to this extent.

The accompanying illustrations show practically all of the solid commercial car tires. The cross wire and wireless hard rubber base types are most prevalent. Many are also made with cross wires and endless wires combined, while another type is the wire mesh base brought out by the Diamond Rubber Company. Many makers are offering different styles of treads all destined for a particular class of work or weight of vehicle.

Every commercial car owner would find that much better service would be secured if he anticipated this overloading, and ordered his cars equipped with tires large enough to carry double the rated capacity of his car. The tables of carrying capacity adopted by tire makers, which we give below, it should be borne in mind are the extreme load and do not allow for any overloading whatever, so that a car should always be provided with larger tires than actually called for by its carrying capacity.

### Pneumatic Tires.

| Size<br>Inches | Single<br>Extreme<br>Load<br>per Wheel,<br>Pounds | Air Pressure<br>Recommended, per<br>Pounds | Dual<br>Extreme<br>Weight<br>per Wheel,<br>Pounds |
|----------------|---------------------------------------------------|--------------------------------------------|---------------------------------------------------|
|                |                                                   |                                            |                                                   |
| 28 to 36x2½    | 225                                               | 40                                         |                                                   |
| 28 to 36x3     | 350                                               | 50                                         |                                                   |
| 28x3½          | 400                                               | 60                                         |                                                   |
| 30x3½          | 450                                               | 60                                         |                                                   |
| 32x3½          | 550                                               | 60                                         |                                                   |
| 34 and 36x3½   | 600                                               | 60                                         |                                                   |
| 30x4           | 550                                               | 75                                         |                                                   |
| 32x4           | 650                                               | 75                                         |                                                   |
| 34x4           | 700                                               | 75                                         |                                                   |
| 36x4           | 750                                               | 75                                         | 1200                                              |
| 32x4½          | 700                                               | 85                                         |                                                   |
| 34x4½          | 900                                               | 85                                         |                                                   |
| 36x4½          | 1000                                              | 85                                         | 1350                                              |
| 36x5           | 1250                                              | 90                                         | 1500                                              |
| 38x5½          | 1350                                              | 90                                         | 2000                                              |
| 40x6           | 1500                                              | 90                                         |                                                   |

### Solid Tires.

| Size<br>Inches | Single<br>Extreme<br>Load<br>per Wheel<br>Pounds | Size<br>Inches | Twin<br>Extreme<br>Load<br>per Wheel<br>Pounds |
|----------------|--------------------------------------------------|----------------|------------------------------------------------|
|                |                                                  |                |                                                |
| 2              | 500                                              |                |                                                |
| 2½             | 750                                              | 2½             | 1900                                           |
| 3              | 950                                              | 3              | 2500                                           |
| 3½             | 1375                                             | 3½             | 3500                                           |
| 4              | 1750                                             | 4              | 5000                                           |
| 5              | 2000                                             | 5              | 6000                                           |
| 6              | 3000                                             | 6              | 8000                                           |
| 7              | 4000                                             |                |                                                |



Polack Single



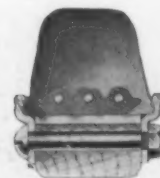
Gibney Single



Swinehart Single



Goodrich Single

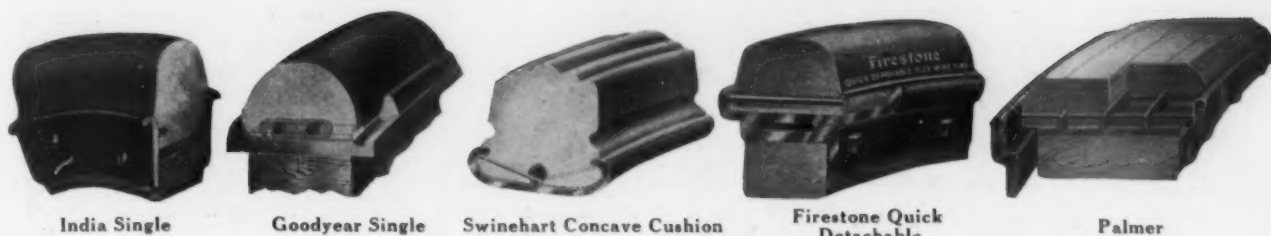


Hartford Single



Republic Single





The following paragraphs give detailed information regarding the different makers represented, and should enable the owner to select the proper tire equipment for his commercial cars.

**DIAMOND TRUCK TIRES** are made in three styles, namely, Demountable Wire Mesh Base, Side Wire and Solid Clincher. The wire mesh base type tire is made in all sizes, from 30x2 to 42x7 inches in single type and in all sizes from 30x2½ up to 42x5 in twin type. The single type is capable of carrying 500 to 4,000 pounds per tire, while the double will carry from 1,900 to 8,000 pounds, according to size of tire. The base of the tire is made up of a mesh of fine wires into which the rubber is forced and the body of the tire is built upon it.

The Diamond Side Wire Tire is made in single and twin type, in all sizes, from 28 up to 64 inches. The particular feature of this tire is the fact that it is spliceless, thus preventing water, dirt or other foreign substances from creeping into the tire and separating the base and wires. As illustrated, a channel and retaining side wire are used, the retaining wire encircling the tire and overlapping the cross wires vulcanized within the rubber. This tire is made both endless and butt-end. Another Diamond product is the solid clincher motor truck tire, which is designed especially for light delivery wagons, or trucks having a capacity of 3,000 pounds or less. It is made spliceless and is held in place by compression of bead of tire under clincher part of rim. The diagonal cross bars, seated in base of tire, imbedded at the center in cement and engaging under the clincher part of rim, prevent creeping and give the necessary rigidity at base of tire. It can be used on regular one piece clincher rims or on clincher demountable rims as desired. This tire is made in 2, 2½, 3, 3½ inch sizes, and in all diameters, from 26 up to 39 inches. These tires are manufactured by the Diamond Rubber Co., Akron, Ohio.

**FIRESTONE SOLID TIRES** are all of the side wire type, and are made in single and twin styles. This year the Firestone Tire & Rubber Co., Akron, Ohio, has developed a quick removable tire, the same being mounted on a quick detachable rim. The base of the tire consists of several layers of fabric, which is vulcanized to the tire body. Cross wires are imbedded at short intervals just below the lower edge of the rim. Over these cross wires, the two side wires are run around the entire circumference, one on each side. In removing the tires, the driver does not need to tamper with the fastenings of the tire itself. The rims are merely changed. To remove the tire it is only necessary to remove the nuts from the through bolts,

thus releasing the clamping flange. The tire, rim and all can then be removed in one lateral movement. The triangular section clamping rim is split and comes off along with the tire and rim. These tires are furnished with endless form to fit wheels of standard diameter, and are made in eight sizes, from 2 to 7 inches in width. For automobile fire engines, motor ambulances and for use on all kinds of motor city apparatus that travel at a high rate of speed, the Firestone Company is offering the "Firestone" dual pneumatic tire in connection with "Firestone" quick detachable, demountable rims.

**THE PALMER HEAVY TRUCK TIRE** is made up of solid rubber sections or rings. As will be seen from the illustration, these rings are held together by a series of cross rods and bolts. Between each rubber ring a circumferential steel ring is placed. When the felloe bolts are tightened, the rubber sections are closed up, forcing the rubber to hug the base and fashioning the whole into one compact solid rubber tire. A hammer and wrench are the only tools necessary for repairing this tire. The cut shows a section of an eight inch tire. This tire is made up in various thicknesses, from 3 to 10 inches and in diameters of 34 and 36 inches. Larger sizes are made to order. This tire is manufactured by H. H. Palmer, Akron, O.

**MORGAN & WRIGHT** truck tires are also of the side wire type, the retaining wires being sprung over the edges of the channel and rest on the ends of horizontal cross bars, which are in turn held in place by a hard rubber base. The fabric is also brought up well along the sides of the tire, thus giving the cross pins additional holding surface. An extra quality of white rubber is used for the tread of these tires, giving long life and wearing qualities. The tires are made in single and twin styles, and are mounted on demountable rims if desired. Morgan & Wright furnish these tires in all sizes, from 30x2 to 36x7 inches.

**GIBNEY WIRELESS MOTOR TIRES** are featured by James L. Gibney & Bro., of Philadelphia, in their line of commercial vehicle tires. These tires are moulded with a metal base, which is dovetailed into a hard rubber sub-base upon which is inseparably vulcanized the rubber tread. These three parts are moulded and vulcanized in one operation, thereby forming an absolute unit. The side plates are moulded to the felloe and the nuts are countersunk. Circumferential movement of the tire is prevented by a key, which is moulded on the felloe band, and which fits into a groove cut on the underside of the metal base of the tire, thus entirely preventing creeping. The





Motz Cushion



Firestone Single



Goodyear Dual



Firestone Dual

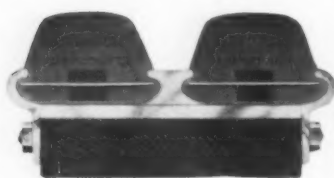
single type is made in 3, 3½, 4, 5, 6 and 7 inch sizes, and has a guaranteed carrying capacity of 950 pounds to 4,000 pounds, according to size of tire. The dual types are made in 3, 3½, 4 and 5 inch sizes, with carrying capacities of from 2,500 to 6,500 pounds. These tires are made with narrow treads, which the manufacturers claim gives easier riding qualities. The method of construction and fastening allows the twin tires to be set on the felloe band in direct contact with each other. The narrow tread gives a maximum contact with rough and uneven road surfaces, giving a uniform distribution of weight upon the tire, less necessity for offsetting the felloes to provide clearance on the drive side of the wheel, thereby making a more central distribution of the weight upon the hub and spokes. The Gibney side wire tire is made in both the endless and butt-end variety. This type of tire is made in eight sizes, from 2 to 7 inches in diameter, having a carrying capacity of from 500 to 5,000 pounds per tire.

FISK BOLTED-ON TYPE dual pneumatic tires, manufactured by the Fisk Rubber Co., Chicopee Falls, Mass., have

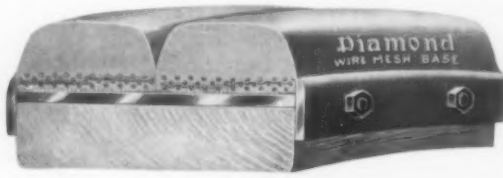
are held in position by small lugs fastened by bolts. The Hartford tires are made by the Hartford Rubber Works Co., of Hartford, Conn., in all sizes, from 28x2½ to 60x4 in single type and 32x3 up to 42x4½ in twin type. The solid tires are made with three different shaped treads.

GOODYEAR COMMERCIAL CAR TIRES, manufactured by the Goodyear Tire & Rubber Co., of Akron, Ohio, also have the hard rubber base incorporated in their construction. In this tire the base is regular in shape, in which are imbedded the retaining wires. The soft rubber tread and base are perfectly united, making one solid piece, which cannot be torn apart under the heaviest of loads. The tire is prevented from creeping by having metal cleats fastened at intervals to the tire seat of the rim. These cleats fit into slight depressions in the base of the tire, giving the tire a permanent and positive position on the rim. These tires are made in all sizes, from 32 to 42 inches, and in eight diameters, from 2 to 7 inches.

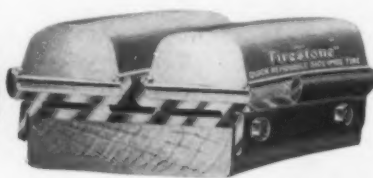
SWINEHART TIRES are of the solid type, with cross rods placed transversely across base of the tread at the widest point



Republic Dual



Diamond Wire Mesh



Firestone Dual Quick Detachable

been primarily designed for use on motor driven fire apparatus. With the Fisk rim and tire it is only necessary to unscrew five nuts that lock the expanding ring in place. A special spanner is furnished for these nuts, but any common wrench will do. The tires can then be easily pulled off and new ones put in place in less than two minutes. These tires are made in all sizes, from 28x3 to 37x5½ inches.

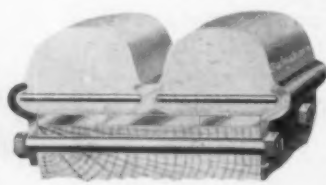
HARTFORD SOLID RUBBER TIRES are made somewhat differently from the regular line of wire base tires. The base of this tire is of hard rubber in which are imbedded three endless wires. The hard rubber base is irregular in outline and is vulcanized to the tread proper. The tire is forced on over the steel band, thus creating a tension on the internal wires which, together with the compression of the side flanges, holds the tread firmly in place. The Hartford tire is made in single and dual types and is mounted on the new Whittlesey "Demontachable" rim. This rim consists of two split edged rings, which

of the clinch. The base of the tires is made to fit the clinch perfectly and is also large enough to be slightly compressed when the flange is in position on the wheel. The base of the tire is a number of layers of fabric impregnated with rubber and vulcanized to the tire proper. These tires are made in all standard sizes and wheel diameters. The tire can be easily removed or applied, by simply removing the flange and pulling off the tire and vice versa. For motor buggies and light delivery cars, the Swinehart Tire & Rubber Company, of Akron, Ohio, have gotten out a special tire which, on account of the peculiar construction of the tread, makes it superior in riding qualities to the solid tire. This tire can be easily applied with a hand tool.

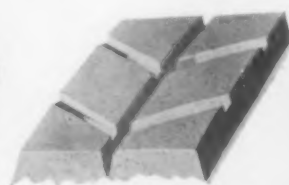
GOODRICH TIRES are of the wireless type, the tire being vulcanized on to a special steel base having dovetail grooves on the top surface. This sub-base is of hard rubber. On to the latter is vulcanized a soft rubber tread or the tire



Gibney Dual



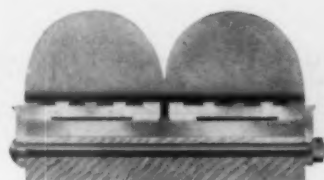
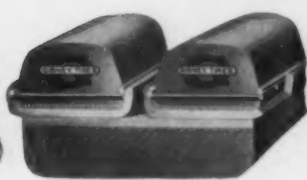
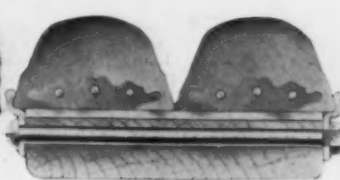
Swinehart Dual



Goodrich Block Wireless



Morgan &amp; Wright Dual

**Polack Dual****Gibney Dual****Hartford Dual****Goodrich Dual**

proper. The tire is prevented from creeping by a transverse key on the steel felloe band, which fits into a key seat in the steel base of the tire, preventing circumferential movement. The dual type is mounted in a similar manner as the single, both tires being brought close together. In addition to their regular styles of single and dual solid tires, the B. F. Goodrich Co., of Akron, Ohio, have recently placed on the market a new design of block tread, as illustrated. Goodrich tires are made in all sizes, from 32x3 up to 42x6 inches.

THE REPUBLIC SOLID MOTOR TRUCK TIRE is another type in which the cross wire is featured. In this tire the hard rubber base consists of a strip which runs lengthwise with the tire and is just deep enough to permit the cross wires to pass through it. This strip and the tread proper as well as the cross pins are, of course, all vulcanized into one solid mass. The entire base of the tire, as well as the sides are covered with a multiple of layers of fabric, which not only help to stiffen the base, but prevents the end of the cross wires from coming in direct contact with the inturned clincher flanges. The flanges are offset sufficiently to entirely protect the heads and nuts of the bolts from coming into contact with curbstones, car rails, etc. These tires are manufactured by the Republic Rubber Co., of Youngstown, Ohio, in single and dual types and in all sizes.

THE MOTZ CUSHION CLINCHER TIRE is of the solid variety, but is somewhat different in construction from the regular type of solid base tire. In this tire, the feature lies in the bridge construction between the base of the tire and the tread. The supports on the sides of the tire are of solid rubber and an integral part of it. The cross bridging permits the tire to bend when an object is met with on the road, thus cushioning the tire. The latter feature, in addition to the twin tread, prevents skidding and slipping. This tire is fitted to the rim by means of cross wires, which run diagonally through the lower section of the tread, and the ends of which are grasped by the inturned flange rim. This tire is manufactured by the Motz Clincher Tire & Rubber Co., of Akron, Ohio, and is especially desirable for light commercial cars. This tire will fit rims intended for pneumatics and is made in sizes up to 40x5 inches.

THE DAYTON AIRLESS TIRE is a sort of semi-solid construction and from outside appearances, resembles a pneumatic tire. In reality, however, it is a very heavily constructed pneumatic casing, the inside of which is studded with blocks of rubber, as will be readily seen from the accompanying cut. This tire, it is claimed, will ride as easy as the pneumatic, and has the advantage of being puncture proof. It is made in all sizes, from 28x3 to 36x5 inches to fit standard clincher rims. It is applied in the same manner as the ordinary pneumatic clincher tire, and is manufactured by the Dayton Rubber Mfg. Co., of Dayton, Ohio.

POLACK SOLID TIRES are of the hard rubber and steel band base variety. The steel band has a wedged shaped groove on its circumference, which is filled with hard rubber so that there will not be a steel to steel bearing surface across the entire width. Upon this band is mounted a hard rubber sub-base, and upon the latter, a soft rubber body of the tire is vulcanized. It will be noticed that one side of the tire band, forming the base of the tire, is covered with rubber, while the opposite side is uncovered. In connection with the dual types, the two rubber edges are placed at the center of the wheel rim and tires are pressed on one from each side of the wheel. These tires are made in single and twin types, from 2½ to 6¼ inches cross section. The Polack tire is well known in Europe, and the sole rights to manufacture same in America have been secured by the Polack Tire Co., 1741 Broadway, New York City. The tire is manufactured for this concern by the Pennsylvania Rubber Co., of Jeannette, Pa.

THE KELLY-SPRINGFIELD BLOCK TIRE, made by the Consolidated Rubber Tire Co., of Akron, Ohio, is in a class by itself. This tire consists of a series of rubber blocks, having at their lower end an extension or collar. These blocks are slipped through holes cut out in a steel band, which is clamped upon the felloes and securely holds the blocks in place. In the twin styles, the holes are staggered. The band is sectional, three sections to a wheel. In case of damage to one or more of the blocks it is an easy matter to replace the worn blocks by new ones.

**Kelly-Springfield Single****Kelly-Springfield Dual****Fisk Dual Pneumatic****Dayton Cushion****Firestone Dual Pneumatic**



## A Solid-Pneumatic Tire

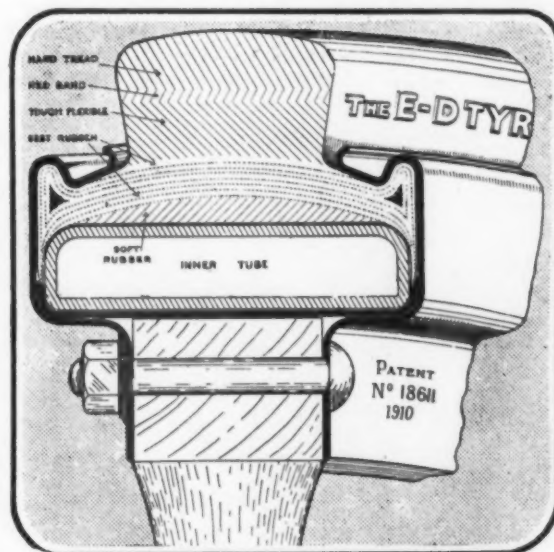
The Evans-Doubleday solid pneumatic tire, an English invention, which is illustrated herewith, is attracting considerable notice on the other side. It seems to possess considerable merit for use on the lighter classes of commercial vehicles. It is claimed for this tire: that the life will be at least three times that of an ordinary pneumatic; that its first cost will be about the same as for a pneumatic; that in smoothness of running it leaves little to be desired; that it is puncture proof; in the event of the splitting of an inner tube, the tire may be run as a solid, until such time as a permanent repair may be effected; that it does not heat up so much as a pneumatic; and that it has greater lateral stability.

The construction of the tire is clearly shown. Attached to the wooden felloe of the wheel, there is a steel rim of greater width than the ordinary rim. This rim acts as a bond for the wheel felloes, and also serves as a bed on which the inner tube may bear; further, it locates the side flanges. On each side of the rim, and clamped to the sides of the felloes by means of bolts and nuts, there are two pressed steel side flanges, one of which is permanently fixed and the other is removable, so as to facilitate the mounting or dismounting of the tire. These flanges and the rim are enameled, so as to obviate the possibility of damage to the rubber by rust. The inner tube is just an ordinary air tube provided with a valve, such as is used for the usual form of pneumatic tire. The solid part of the tire is constructed in one piece, but it really consists of two parts—a flexible band of canvas and rubber, which has a bead at each edge, and which provides for the inward movement against the air tube, and the tread, or wearing portion. The lower edges of the beads are extended and are tapered off so as to form curtains which overlap the up-turned edges of the steel rim, thereby affording protection for the inner tube and guarding against the possibility of nipping. The tread consists of a very tough quality of rubber, which rests on a narrow layer of red rubber. It is claimed by the maker that, when the tire has been worn down to this red band, it may be retreaded. The third layer, or base, of the solid portion of the tire is of a tougher and more elastic quality of rubber. As the tread of the tire meets with inequalities on the road surface, it is more or less depressed, causing flexure of the canvas base of the solid portion, and compressing the air in the inner tube in the manner of an ordinary pneumatic tire. The thick solid tread of the "E. D." tire acts as a shock absorber, and the violent rebound which is inseparable from ordinary pneumatic tires over bumpy roads is reduced very considerably.

A number of these tires is now being tested to destruction, to determine its wearing qualities.

The absorption of road shocks at the wheel rim, or be-

tween the rim and the axle, is absolutely necessary, if a motor vehicle is to be operated successfully on ordinary roads. For light high speed commercial vehicles, such as taxicabs, it has been found practically hopeless to attempt to run on wheels with standard type solid rubber tires; neither the passengers nor machinery can long tolerate the vibration, and, consequently, the wheels of practically every taxicab at present in public service are shod with the pneumatic tire. The immense importance of the tire problem has by no means been overlooked, and numerous variations of the pneumatic type of tire have been produced from time to time, but without material divergence from custom on the part of users. In order to render the use of ordinary solid tires possible, special spring mounting systems, as well as flexible and pneumatic hubs, have been tried, some of them with a measure of success, whilst the systematic evolving of spring wheel devices by a certain class of inventors continues unabated.

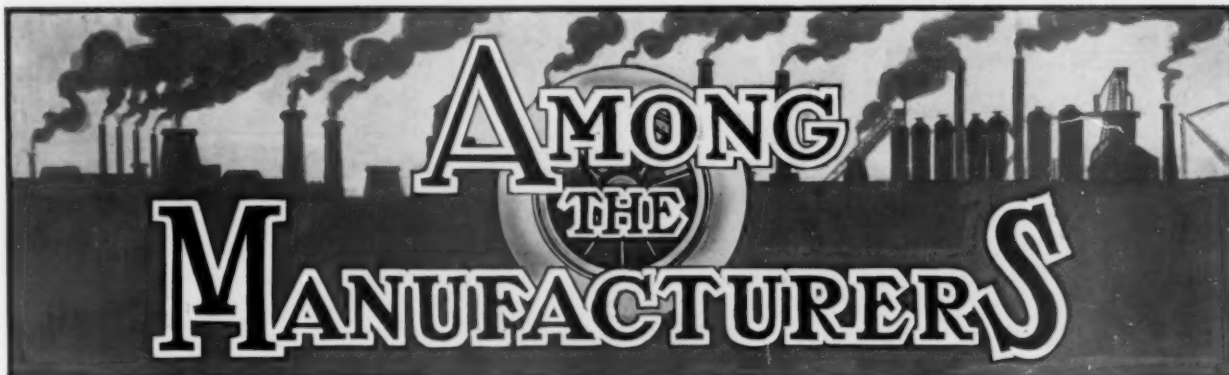


The "E.D." tire appears to be one for which owners of motorcabs and small vans have long been waiting, viz., a pneumatic tire that can be used for vehicles of moderate weight with at least the same degree of economy as is obtainable with solid tires, whilst possessing a degree of elasticity comparable with that of pneumatics. If time and the exhaustive tests to which this make of tire is now being subjected support the claims advanced by the company, the practical value of the "E.D." tire must quickly be appreciated by all users of light commercial vehicles.—*From the Commercial Car.*

UNITED STATES TIRE CO. announce that in their commercial car tire department they will keep in close touch and give special attention to owners of trucks who use their tires, the plan being to co-operate for mutual good.

CHAS. F. KASERMAN, of New Philadelphia, O., U. S. express agent and a drayman, has recently purchased a 2½ ton Atterbury truck for use in his business. Kaserman has obtained the agency for the Atterbury people in this county.





### DRIGGS SEABURY ORDNANCE CORPORATION TO BUILD COMMERCIAL CAR PARTS

The Driggs Seabury Ordnance Corporation, of Sharon, Pa., has recently closed a contract for manufacturing five of the parts used in the Commer Motor Truck, which has heretofore been manufactured in England. It has been adopted by the Turkey and Russian Governments for use in war maneuvers. This will mean the employment of many additional men. Officers have recently been elected as follows: Chas. W. Blackman for the past two and a half years, General Manager, was elected to the office of Secretary, succeeding Thos. A. Harris, who resigned. The Board of Directors is as follows: John Stevenson, Jr., D. M. Stevenson, John Fahnline, S. E. Gross, Chas. W. Blackman, Wm. Flinn and Frank I. McGill.

### BOWLING GREEN MOTOR CAR CO. INCORPORATED

The former plant of the Gramm Motor Car Co. has been recently opened up by the newly organized Bowling Green Motor Car Company. This company has been incorporated with a capital stock of \$100,000 and will manufacture a light delivery truck weighing from 1,000 to 1,500 lbs. The company has orders now for 75 cars and during the year expects to place 200 cars. These trucks will be handled through 72 agencies of The Gramm Motor Car Company, which insures the greatest possible prominence for them, as the Gramm factory is not making so light a truck as this and will push this one.

The following officers have been elected: President, J. B. Wilson; vice-president and general manager, S. F. Sawyer; secretary, T. J. Miller; treasurer, J. W. Underwood.

### GRAMM TRUCK TO BE BUILT IN CANADA

The Gramm Motor Truck Co., of Canada, Ltd., Walkerville, Ont., has been recently organized with \$150,000 capital to manufacture the Gramm motor truck in Canada as built by the Gramm Motor Truck Co., at Lima, O. Agencies are being established throughout Canada but it is planned to build no more than 150 trucks the first year. A completely equipped factory building has been secured at Walkerville. This move has been caused by the tariff barrier which prohibits the employment of American motor wagons in Canada, and the high freight rates which are charged for shipping to the west and southwest.

### AMERICAN MOTOR TRUCK CO. MOVES

Contracts were signed recently for the removal of the American Motor Truck Company, of Lockport, N. Y., to Findlay, Ohio, and consolidation with the Findlay Motor Company, with a capital stock of \$550,000. The Lockport concern has been employing 200 men, and a larger part of these, with their families, will remove here. Extensive additions will be made to the local plant, as the company has orders on its books for more than 1000 trucks.

### ONE HUNDRED FIRESTONE TRUCK TIRE DEPOTS

Confidence in the growth of the truck industry has prompted the Firestone Tire & Rubber Co. to increase its service stations for side wire truck tires to considerably more than one hundred. This concern's prestige as commercial car tire manufacturers requires it to maintain this large number of depots for the sale and application of tires in order to give immediate deliveries to truck users. It is the company's aim always to keep ahead of the times and give Firestone users a little better service than they might reasonably expect.

### THIRTY-ONE TRUCKS ONE ORDER

Mack Bros. Motor Car Co., of Allentown, Pa., recently closed a deal with the New York Telephone Co., for furnishing the latter concern with thirty-one Mack trucks, representing a cost of more than \$100,000. Fifteen of the machines will be one-ton capacity and sixteen of three-ton capacity.

THE MARVEL CARBURETOR Co., of Indianapolis, Ind., have developed a carburetor for motor trucks which is designed to be economical in the use of fuel and to run smoothly on low engine speeds in cold weather.

MARCUS I. BROCK, vice-president and manager of the Thomas Motor Cab Co., of Buffalo, New York, having accomplished what he set out to do, namely, the placing of the Thomas Motor Cab Co., on a firm financial basis, is enjoying a much needed rest at his home at Wayne, Pa.

Mr. Brock entered the industry in 1903 as sales manager of the Autocar Co., then became assistant general manager of the Association of Licensed Automobile Manufacturers, serving as a member of the show and other committees, and in 1909 assumed the general management of the Thomas Motor Cab Co., from which he has just resigned.

THE GOODYEAR TIRE & RUBBER COMPANY lately completed a large addition.

THE R. L. MORGAN COMPANY, of Worcester, Mass., is to introduce shortly a three ton truck.

D. F. POYER & Co. has established a plant in Menominee, Mich., where light delivery wagons will be manufactured.

THE GRAMM MOTOR CAR CO., Bowling Green, Ohio, is now turning out a new 1 ton truck in addition to the larger machines.

THE CHICAGO AUTO TRUCK CO. is endeavoring to leave Chicago, and plans are under way, looking to locating in Xenia, Ohio.

S. B. WHINERY, 95 Liberty street, New York, has been appointed eastern sales agent for Abresch Cramer Auto Truck Co., of Milwaukee, Wis.

THE SPEEDWELL MOTOR CAR CO., of Dayton, Ohio, are now manufacturing commercial cars. Their models for 1911 include a 1½ and a 3 ton truck.

COVERT MOTOR VEHICLE CO., of Lockport, N. Y., have designed a rear axle unit suitable for delivery cars and are now in position to care for quantity contracts.

THE HAZZARD MOTOR MFG. CO., of Rochester, N. Y., have developed an engine especially for commercial car purposes and are now in position to accept contracts.

THE PERFECTION SPRING CO., of Cleveland, O., are now making a specialty of springs for commercial cars, as this company believes its product is especially suitable for motor truck service.

THE MITCHELL-LEWIS MOTOR CO., of Racine, Wis., is now ready to market several types of commercial cars. This concern has been experimenting in the commercial car line for about five years.

MCCLELLAN BROS., in Tiffin, Ohio, have contracted to supply delivery wagons to the Central Delivery Co. The wagons will replace nine horse wagons, and the number of deliveries will be increased.

S. R. BAILEY & Co., of Amesbury, Mass., in addition to manufacturing its pleasure electrics on a much larger scale than usual, will in the near future manufacture a line of electric commercial vehicles.

THE SULLIVAN MOTOR CAR CO., of Rochester, N. Y., have added a two ton delivery car to their line for 1911. It is a two cylinder car, along the same lines as the 1500 pound capacity delivery car they have been manufacturing during the past year.

F. G. MOTT, JR., well and favorably known in the automobile industry, is establishing a sales and service department in Philadelphia for the Alden Sampson Co. Mr. Mott will make Philadelphia his headquarters, although the territory under his control will embrace several States.

DELOACH CONCERN TO MOVE.—The DeLoach Manufacturing Company, which builds automobile trucks at Bridgeport, Ala., is soon to move to Atlanta, Ga. A new charter has been secured and the capital stock has been increased from \$150,000 to \$250,000.

THE ANDERSON ELECTRIC CAR CO., of Detroit, Mich., has recently placed its commercial vehicle department in charge of A. C. Downing, who was formerly Sales Manager of the Waverley Co. Geo. L. Bixby, formerly Superintendent of the Waverley Co., has been appointed Assistant Engineer.

THE ATLANTA MOTOR CAR CO. has succeeded the Atlanta Buggy Co. in its motor car business, and will shortly commence the manufacture of a light truck. The Atlanta Buggy Co. used the name "White Star" for its pleasure cars, and the same name will be used for the commercial cars made by the new company.

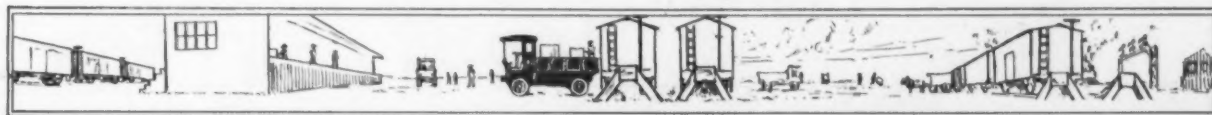
TO ENLARGE AUTO PLANT.—A \$50,000 addition to the plant of the Davis Manufacturing Company, manufacturers of automobiles and automobile trucks, will be erected in the near future according to officers of the company. The capital of the company has been increased from \$100,000 to \$200,000 for the purpose.

MR. BROWNELL, of the Brownell Motor Co., of Rochester, received orders for special truck engines at the Chicago Show from new commercial car makers from nearly every State in the Union. This shows which way the wind is blowing, as it demonstrates the intense interest now centered in the commercial car industry.

W. J. GRAVES, formerly with the P. J. Downes Company as city salesman in the automobile department, with F. R. Brasie, has formed the Brasie-Graves Motorcar Company in Minneapolis, Minn., and will handle the Randolph commercial cars, ranging in capacity from one-half ton to five tons. The company garage and salesrooms will be at 409-411 Fifth street S., and the main office will be at 207 Sixth street, N.

THE ALDEN SAMPSON MANUFACTURING COMPANY, the truck division of the United States Motor Company, several days ago established what probably is a record in motor truck shipments for one day when \$80,000 worth of freight and delivery motors were sent on their way from the factories to all parts of the country. This amount represents the value of 38 Sampson vehicles. Thirty were of 1,000 pounds capacity, six were five-ton trucks and two were four-ton trucks.

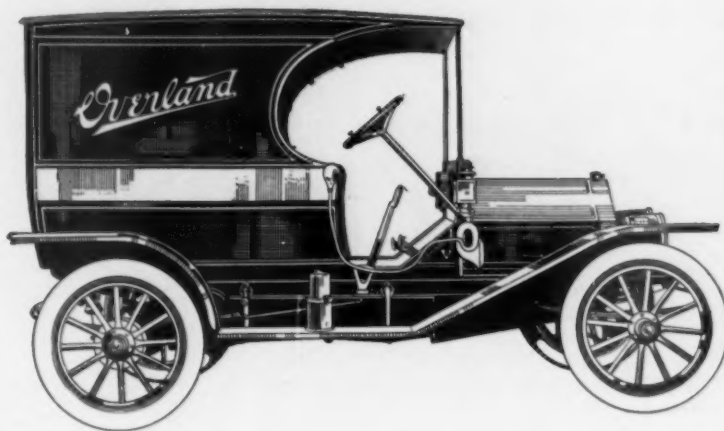
THE MITCHELL-LEWIS MOTOR CO., of Racine, Wis., pioneer builders of wagons and carriages, built its first truck five years ago, and, although it has not been actively engaged in building trucks for the market, it has not been idle. For the present, this concern will limit its output of commercial vehicles to 1000 and 5000-pound wagons. The experience they have gained during the last five years has enabled them to put on the market a vehicle from which all faults naturally incorporated in a machine which is going through the experimental stage, have been eliminated.





*Overland*

Let us  
prove the  
value of



## Overland Delivery Cars to You

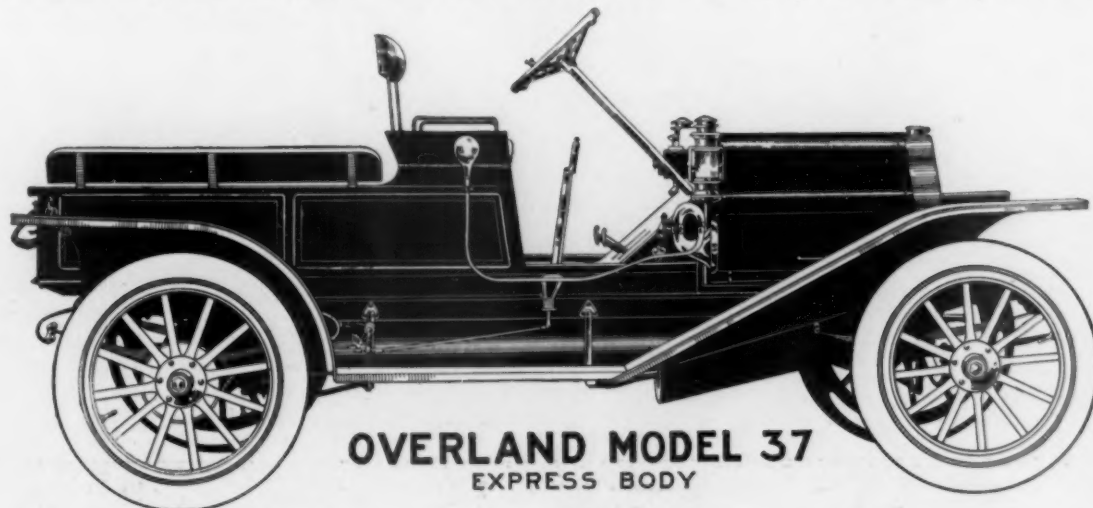
If your business involves the use of delivery wagons averaging daily runs of 10 to 90 miles, send today for our Commercial Car Catalogue. It tells of the actual experience of owners with Overland power wagons—gives details of upkeep costs—proves to you that you cannot afford to be without power wagons.

Overland Commercial Cars will reduce the cost or improve the effectiveness of your delivery service. They are simple in operation, powerful, economical, well built—of material known to endure and give long life—and are consequently serviceable and reliable.

The Overland engine is simple, every part is immediately accessible; it requires the minimum of attention and consequent delays. The result is the Overland may be quickly and correctly operated by anyone, without regard to their mechanical knowledge.

Overland delivery cars are made in two styles, the open express and the enclosed body, either planetary or selective transmission. Our literature illustrates and tells you about them. It is interesting,—you should have it before purchasing any car—a postal will bring it to you.

**THE WILLYS-OVERLAND CO., Toledo, Ohio**



**OVERLAND MODEL 37**  
EXPRESS BODY

# McIntyre

## A Plain Statement of Plain Truck Facts:

The McIntyre line of trucks is built strictly on truck lines and covers the field of light delivery service more completely than any other range of models.

Capacity from 500 to 2500 lbs.

Prices from \$465.<sup>00</sup> to \$1650.<sup>00</sup>

Bodies built to suit purchasers' requirements.

¶ We are the pioneers of solid-tired motor vehicles, and with an experience gained through 40 years of high-class wagon building, offer our trucks unhesitatingly as the best vehicles in their respective classes, regardless of price.

¶ ONE YEAR'S GUARANTEE against defects of material and poor workmanship.

¶ A most liberal treatment of customers and agents.

¶ Our service only begins when we sell you a truck.

¶ Write us NOW for full particulars—ACT NOW!

---

W. H. McINTYRE COMPANY  
AUBURN :: :: :: INDIANA



## Second Anniversary of

# Red Head



## SPARK PLUGS

*Inaugurated March 4, 1909*

The first season was devoted to general introduction.

Over 250,000 certificates were mailed to registered owners throughout the country. Everyone was given an opportunity to test the merits of RED HEAD Plugs at our expense. Was ever such confidence shown by any manufacturer in his product?

The second season was devoted to a strong advertising campaign to create a nation-wide demand—and it was created.

In each advertisement we guaranteed the porcelain not to crack from heat. This guarantee has not been duplicated by any manufacturer.

The third season will be one of PROFIT for everyone handling RED HEAD Plugs because the demand has been created and the profits assured.

A combination of good merchandise, good policy and good advertising always won out and always will.

During the past year more than 100 manufacturers of pleasure vehicles, motor trucks, motor boats, motorcycles and gasoline engines were added to the list of RED HEAD users.

Over 1,000 dealers and jobbers have been added to the already large list of distributors—a substantial proof of the popularity of RED HEADS.

In 1910 RED HEADS were instrumental in shattering world's speed records with such powerful racing cars as the FIATS, driven by Ralph DePalma and Caleb Bragg, the Benz, driven by Erwin Bergdell, and numerous American cars.

Over a half million RED HEADS are used by motorists throughout the country. They have established a record for spark plug efficiency that has no parallel in spark plug history.

**EMIL GROSSMAN COMPANY, Mfr.**  
250 W. 54th Street, New York

BRANCHES:  
Chicago, 1436 Michigan Ave. Detroit, 874 Woodward Ave.



# *Attention, Motor Truck Operators!*

Drivers of Commercial Motor Cars or the men in charge of garages or shops are invited to send short contributions to

## *The Commercial Car Journal*

on any subject which will be of interest to our readers—such matters as difficulties encountered and overcome, tips on roadside repairs, or shop repairs, interesting photographs, unusually meritorious performances of any kind, etc.

We would like to have your ideas on the following and other features of truck service:

“What arrangement between employers and chauffeurs will insure the greatest motor truck service with the least expense?”

“Is it advisable to fine drivers for accidents and breakages, or to give rewards for freedom from accidents and trouble?”

“Is anything gained by making each driver responsible for the condition of his vehicle, and giving rewards for good condition or penalties for poor condition?”

“Does it pay to give a bonus for careful operation, or for largest number of deliveries or greatest ton mileage per dollar of cost of operation?”

“Is it necessary to limit mechanically the speed of trucks and to equip them with recording devices?”

Do not hesitate to give us your view on these or any other features of the service, which in your opinion can be improved.

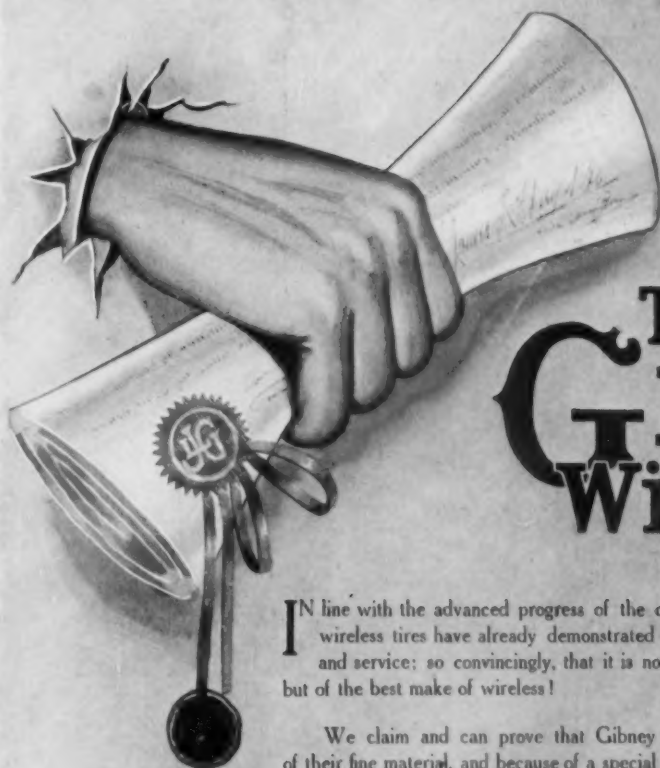
No matter how your letter is written or worded, we will put it into proper shape. When writing use one side of the paper only.

\$5.00 will be paid each month for the best contribution, and \$3.00 a column will be paid for contributions published which do not win a prize.

*In addition*, we will give a prize of \$25.00 to the contributor who wins the largest number of monthly prizes during the year, and a second prize of \$10.00 to the contributor who has the largest number of individual contributions inserted in this department during the year.

## *This Contest is Open for All*

Send in your article as soon as possible to the CONTRIBUTION CONTEST DEPARTMENT, CHILTON COMPANY, MARKET AND 49TH STREETS, PHILADELPHIA.

**OUR TIRE GUARANTEE**

On vehicles for commercial purposes averaging about 25 miles per day, we guarantee the Gibney Wireless Tire for one year. On vehicles such as public service buses, etc., averaging about 100 miles per day, we guarantee the tire for three months.

*Jas. L. Gibney & Bro.*

# We Guarantee The Service of **GIBNEY** Wireless Tires

**I**N line with the advanced progress of the commercial motor truck industry in the past few years, wireless tires have already demonstrated their logical efficiency from the standpoint of economy and service; so convincingly, that it is now not a question of wireless tires versus wired tires—but of the best make of wireless!

We claim and can prove that Gibney Wireless Tires are superior to other makes, by reason of their fine material, and because of a special built-in process by which we make the tires an inseparable part of the wheel itself. Also, because they possess the two cardinal essentials which all good tires should have, namely: Resiliency and Durability. They last longer, are more reliable and save considerable tire expense.

**We sell Gibney Wireless Tires—not on faith—but with a solid “puncture-proof” guarantee back of them. Can you ask for more?**

We have an interesting collection of facts relative to the superior service and ultimate economy of Gibney Wireless Tires—yours for the asking.

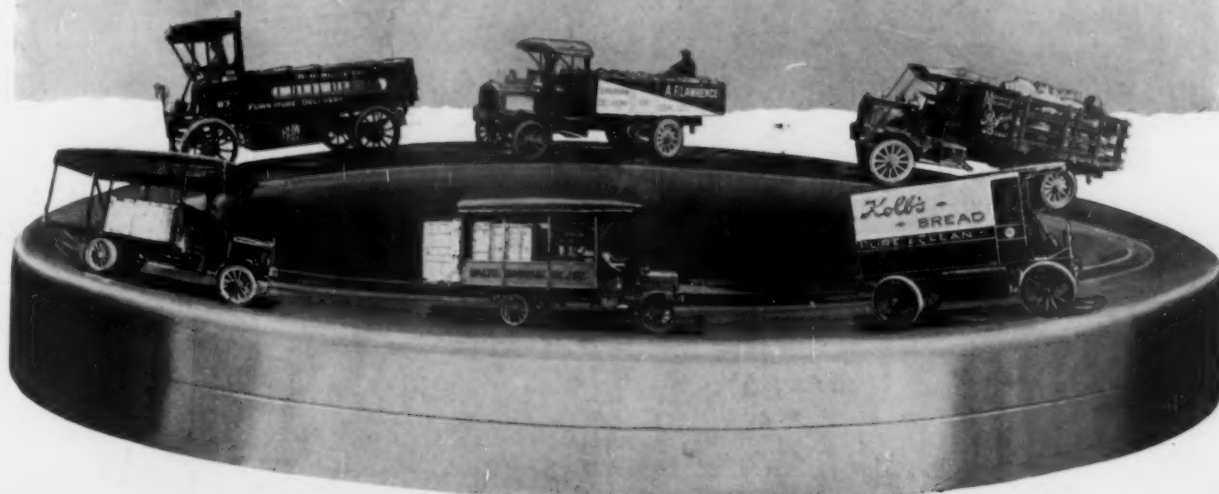
*Will You Write Us To-day?*

**JAS. L. GIBNEY & BRO.**

MANUFACTURERS

PHILADELPHIA, PA.

248-52 West 54th Street, NEW YORK





**An Automobile is no better than its brake, and the brake is not the best, if it is not equipped with **AUTOBESTINE** Brake Lining.**

This is the one part of the car which must not contain an element of doubt, for the brake must work one time more than ninety-nine in a hundred to make the car safe to operate. **Autobestine** is a combination of purely mineral and absolutely fire-proof substances and is indestructible under any degree of friction heat. Put it to the severest tests—twist it, bend it, try to tear it. The more severe the test, the greater your realization that **Autobestine** is a brake-lining of

extraordinary merit. Nothing can injure it. It can stand any sort of abuse—water, air, heat or cold.

A properly made brake fitted with **Autobestine Brake Lining** will never fail you. It will respond instantly to the slightest touch and will outwear the best car built.

To those manufacturers who wish to make tests of **Autobestine**, we will send samples without cost.

*For prices and full particulars write to the sole manufacturers*

**Woven Steel Hose & Rubber Co.**  
**TRENTON, N. J.**

NATIONAL SALES CORPORATION, Factory Sales Manager

250 WEST 54TH ST., NEW YORK

DETROIT : 874 Woodward Ave.

CHICAGO : 1436 Michigan Ave.





# Your Driver's Foot Cannot Slip on APCO PEDAL GRIPS


*A strong steel plate with two bolts fitted with square shoulders to prevent turning is imbedded and vulcanized securely into the thick corrugated resilient rubber back.*



*Ten sizes to fit every car and truck—*

*\$1.00 to \$2.00 per pair.*

*They are waiting for you, Mr. Truck Owner,—waiting to prevent disaster!*

Every driver wants  PEDAL GRIPS, because he needs them, and because he KNOWS he needs them. An infallible safeguard, giving that indescribable sense of security that takes all the anxiety out of driving a commercial vehicle. Securely attached in a few minutes and will last for years.

Metal pedals, with their hard, icy-smooth, slippery surfaces, are ALWAYS uncomfortable, and often unsafe. You've learned this, no doubt, when you wanted your brakes surely and in a hurry—your foot has slipped, or felt like slipping and robbed your muscles of half their power.

Such a slip may mean disaster—often does mean disaster. Hundreds of costly little smash-ups and not a few serious accidents are caused by the unsure, insecure grip afforded by metal pedals.

All this annoyance, discomfort and danger can be avoided by using APCO PEDAL GRIPS, which provide a large, solid, steady pressure-surface for the foot. The corrugated rubber clings,—THE

**FOOT CANNOT SLIP.** The driver feels free to throw all of his weight upon the pedal.

The thick rubber cushion takes up vibration and jar. APCO PEDAL GRIPS rest you,—slippery metal pedals tire you.

**Made in Ten Sizes to fit every car and truck**

**\$1.00 to \$2.00 per pair**

*A form of insurance too valuable and too inexpensive to be disregarded by any owner of a motor truck.*

If your supply house does not carry APCO PEDAL GRIPS, write us, giving name and model of car or truck, and we will send them to you.

## AMERICAN PEDAL COMPANY

1733 BROADWAY

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NEW YORK CITY



Wheel for Heavy Motor Truck

## The Schwarz Wheel

has become recognized as the standard of quality. The question usually asked of a wheel maker by a wheel buyer is: "How do your wheels compare with the Schwarz?"

There is no secret about the success of our wheels, for we use the best of selected stock and our construction insures greatest strength.



Schwarz Patent Spokes

Spokes at the tenon are grooved and mortised and interlock, forming an absolutely compact, immovable assemblage, which cannot loosen under the most severe strain. The only wheel with positive and evenly distributed spoke support. Can be made and shipped complete without hub.

We were pioneers in the manufacture of the heavy truck wheel, and have made of it a careful study. We maintain a special, fully equipped department for this work, and are prepared to design and proportion wheels in proper keeping with the other features of construction. Our engineers are at your disposal.

All the leading manufacturers of Motor Trucks use the **Schwarz Wheel**—strong evidence of its superiority. It is the only wheel which will stand up continuously under heavy stress.

*Send for Illustrated Booklet*

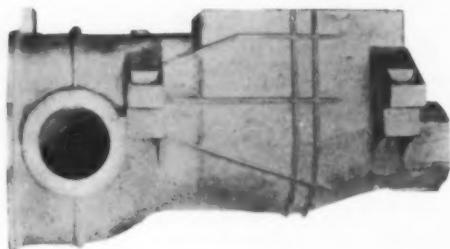
Don't hesitate to write us for fear our prices are too high. We sell wheels as cheap as you can buy satisfaction.

## The Schwarz Wheel Company

Frankford, Philadelphia



## AUTOMOBILE BRAND CASTINGS



LIGHT MANUFACTURING &  
FOUNDRY CO., POTTSTOWN, PA.

## Get Good Bearings

Good bearings carry weight with little fuel expense.



### AUTOMOBILE BRAND

PLASTIC BRONZE for general bearings.

PHOSPHOR BRONZE for hardened and ground shaft.

DIE CASTINGS when the compression strain is not excessive.

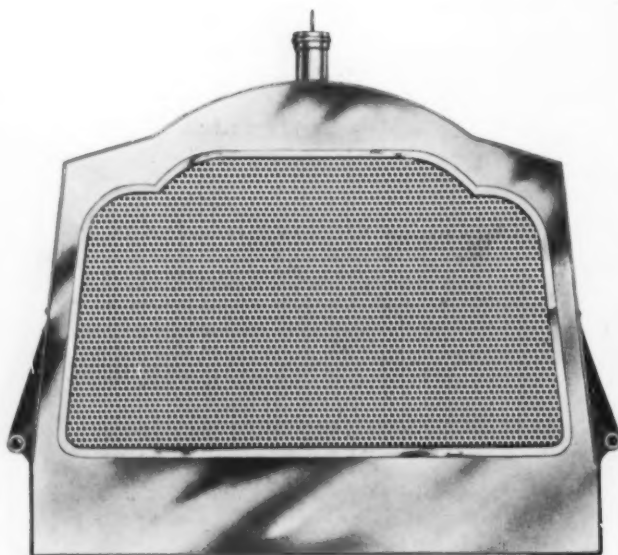
The practical buyer will figure what it costs to carry each pound of dead weight a year; this is constant load and more important than capacity load, as it catches you going and coming.

### AUTOMOBILE BRAND

ALUMINUM castings weigh only one-third as much as Red Brass, and are about as strong, and better suited for many purposes.

MANGANESE BRONZE is a good substitute for drop forgings when the quantity will not warrant the cost of dies, and when prompt deliveries are a factor.

## VITALLY IMPORTANT



to the success of a motor truck is the RADIATOR,—this fact is universally recognized—no other part deserves the same consideration.

We manufacture radiators for nearly every manufacturer of high-grade automobiles. If you will write us, we can give you a list of the most successful automobile makers in America,—all of whom use

### FEDDERS RADIATORS

What does this prove to you?

FIRST—that we have the most satisfactory radiator; SECOND—that we have the facilities for manufacturing in quantities, so that we can DELIVER ON DATES PROMISED.

Commercial Cars require radiators that will withstand all sorts of wear and tear and severe road shocks,—it is this fact that prompts the leading makers of trucks to use FEDDERS RADIATORS.

Our new catalog contains a world of valuable information for those afflicted with Radiator troubles,—you're sure to find a remedy somewhere in its pages.

MAY WE SEND IT?

FEDDERS MANUFACTURING WORKS, BUFFALO, NEW YORK

# MOTOR TRUCK BANDS

## FOR

# SINGLE OR DUAL TIRES

**MATERIAL**—We are putting into the construction of our bands the very best material obtainable.

**WORKMANSHIP**—Our men have become proficient in this line of work through experience gained in the growth of our motor truck band business.

**PRICE**—The process of electric welding together with the volume of work done in this department assures satisfactory prices.

**DELIVERY**—An unexcelled equipment for the handling of this trade and recent additions to our factory enable us to give good deliveries.

*We solicit your orders along the lines above mentioned*

## THE STANDARD WELDING CO.

Western Representative,  
L. F. McCLERNAN,  
1243 Peoples Gas Bldg., CHICAGO  
1417 Ford Bldg., DETROIT

**ELECTRIC WELDING PIONEERS**  
**CLEVELAND**

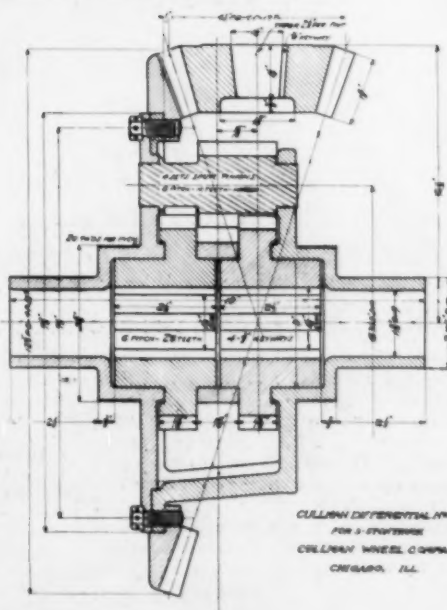
Eastern Representative,  
L. D. ROCKWELL,  
United States Express Bldg., NEW YORK



## CULLMAN SPROCKETS and Differentials

in stock and to  
order.

Send for catalog  
and let us quote  
you on your re-  
quirements.



**CULLMAN WHEEL COMPANY, CHICAGO**  
1351 GREENWOOD TERRACE

# ATTENTION

**Commercial Car Manufacturers,  
Dealers and Consumers!**

The perfect ignition for power trucks is the magneto built for commercial car service, not the delicately made pleasure car magneto. You require strength for service for your truck ignition and for maximum reliability you should use the special commercial car model of the

Guaranteed to start any Auto Engine up to 30 H. P. on a quarter turn of the crank.

Gives a blood-red, pure, dynamic spark that ignites the mixture quickly and thoroughly, giving all the power out of the engine there is in it,—not merely a white, static spark that goes through the mixture without firing it.

Has nearly half less parts than the ordinary High Tension Magneto. Weighs less than 15 pounds.

Write for full information.

We have other models for other engines,—our Model H-T for engines up to 400 H. P. and larger.

We also make \$35.00 K-W Low Tension belt or friction drive Magneto for use with the K-W Coil, and the K-W \$50.00 Electric Road Lighting Outfit.

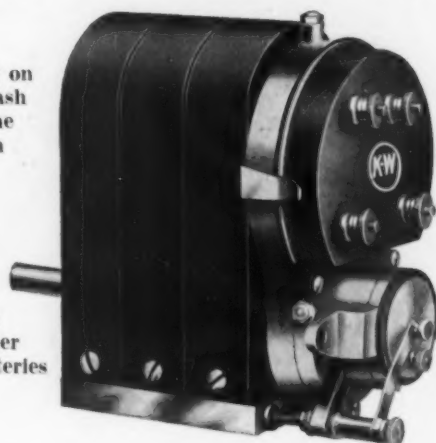
K-W Coils have their windings guaranteed forever against breakdown. \$30.00 for 4-Cylinder Dash.

Write for catalogue.



## K-W MAGNETO

Nothing on  
the dash  
but the  
switch



MODEL J

|                          |         |
|--------------------------|---------|
| 1 Cylinder .....         | \$40.00 |
| 2, 3 or 4 Cylinder ..... | 50.00   |
| 6 Cylinder .....         | 55.00   |

No Coil  
No Timer  
No Batteries

## YOU CAN SAVE MONEY BY USING THE JONES RECORDER

**THIS INSTRUMENT** registers every movement of your truck or delivery wagon.

**IT TELLS YOU** when your vehicle is used without your authorization.

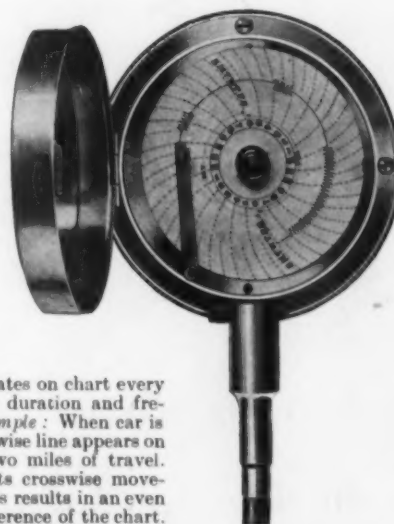
**HOW LONG** it was out of the garage, when it stopped and duration of stop.

**HOW MANY** miles it traveled and how fast.

### HOW THE RECORDER TELLS THE STORY

The numbers around the center indicate the hours for one day and the dotted lines indicate these figures extended. Lettering across disc indicates days of week commencing with Sunday on left. Recording needle travels from the extreme left to the right, marking a plain spiral during eight days, one revolution of disc every day. The method of operating is very simple. The clock movement in the recorder causes a sensitized chart to make one revolution every 24 hours.

The needle (see illustration) indicates on chart every movement of car. Also indicates duration and frequency of car's stoppage. For example: When car is in motion, a short, horizontal crosswise line appears on chart. Each cross line indicates two miles of travel. When car stops the needle ceases its crosswise movement and remains stationary. This results in an even circular line parallel to the circumference of the chart. This circular line indicates when car was stopped and the duration of the stop. The crosswise indication is shown at a slight angle. As car speed increases the angle becomes open. It is in this way that the rate of car speed is determined.



Write us to-day for  
full information

**JONES SPEEDOMETER DEPT, United Manufacturers**  
250 West 54th Street, NEW YORK



# Preliminary Announcement

## In Connection with Economy Contest

We will offer a prize for each class in the Commercial Car Journal's Economy Contest to be competed for by the entrants using



## SPARK PLUGS

during the entire period of the contest.

Details will be published in the April issue of the Commercial Car Journal.

Red Head Spark Plugs are made in all sizes, both porcelain and mica. Uniform price, \$1.00.

**EMIL GROSSMAN CO., Mfr.,**

**250 W. 54th Street, NEW YORK**

BRANCHES: Chicago, 1436 Michigan Ave.; Detroit, 874 Woodward Ave.

**DURABLE**

## OUR 6 VOLT 60 AMPERE

A LIVE ONE

### Truck Type \$15.00 Special Battery

Is a marvel of strength and efficiency and is recommended by Commercial Truck Manufacturers and Boat Builders to be the best on the market. It is acid proof, water tight and fully up to 1200 miles on a properly adjusted coil. Fully guaranteed.

A  
J  
A  
X

**Stronger Built**

**Longer Life**

**By Far the Best**



**Better Finished**

**More Efficiency**

**Approved By All**

A  
J  
A  
X

### Our AJAX \$12.00 STARTER

A Full 6 Volt 50 ampere battery made particularly for Magneto use, but will run your car 800 miles on each charge with a properly adjusted coil; all of which is fully guaranteed

THE AJAX BATTERY CO., 1532 MICHIGAN AVE., CHICAGO, ILL.

**EFFICIENT**

## *Be Careful!*

Don't put too much stress on the power of your engine or the car's carrying capacity—*your ability to stop should be considered.*

*Thermoid Brake Lining  
will hold the load.*

---

MANUFACTURED ONLY BY  
**THERMOID RUBBER CO.**  
TRENTON, NEW JERSEY

## Covert Transmissions and Jackshafts for Commercial Trucks

are the product of ten years of careful and conscientious study and experimental work, and represent the highest degree of efficiency and reliability in transmission construction.

### **Covert Transmissions**

have been used for several years with perfect satisfaction by many of the leading manufacturers.



Before deciding upon the specifications for your new models, let us show you in detail the many advantages of this combination.

Write for our descriptive booklet.

### **Covert Jackshafts**

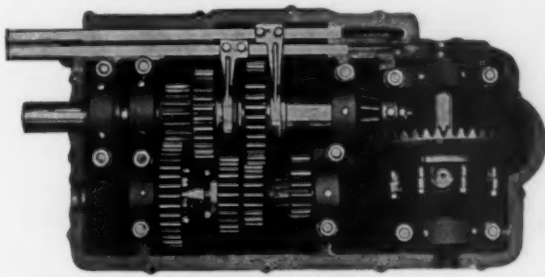
are made in several sizes for commercial cars and trucks ranging from  $\frac{1}{2}$ -ton to 3-ton capacity.

**COVERT MOTOR VEHICLE CO.**

Transmission Specialists

(The name "COVERT" on a transmission case is reliability insurance)

LOCKPORT, NEW YORK



Type No. 750

## Brownell Truck Transmission

**This is not a Make-Shift Gear-Shift!**

This transmission was designed for Commercial Cars, and will withstand the hard usage to which automobiles are subjected when employed in trucking service.

The gears are of SPECIAL OPEN HEARTH STEEL FORGINGS. There are eight TIMKEN ROLLER BEARINGS and AUBURN BALL BEARINGS inserted to take care of the thrust of the square shaft.

The weight of the transmission complete is 385 lbs., and its capacity is from five to six tons. The speeds are three forward and one reverse.

It is a SELECTIVE SLIDING GEAR, containing differential for double chain drive. We guarantee these transmissions for one year against defective material and workmanship.

**REMEMBER**—this is a specially designed and constructed transmission made for commercial cars, and is not a make-shift pleasure car gear shift.

*Write for further particulars*

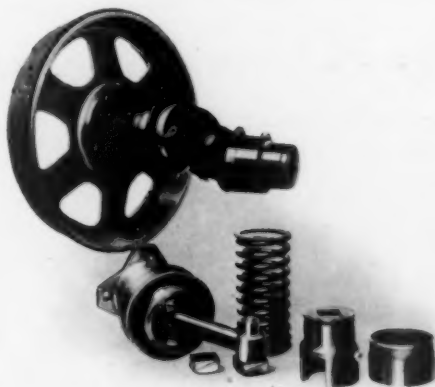
**F. A. Brownell Motor Company**  
Rochester, New York

**"Reliable Springs are  
More Important on  
Commercial Cars than  
on Pleasure Cars."**



**THE PERFECTION SPRING CO.**

Cleveland - - - - - Ohio



### CONE CLUTCHES

CONTROL SETS

STARTING CRANKS

### RADIATOR FANS

Special Stampings and Machine Work

*Correspondence Solicited*

**OTTO KONIGSLOW MFG. CO.**  
CLEVELAND

Sales Agents: FULTON-ZINKE CO.  
1256 Michigan Ave., Chicago, Ill.

## "HAZARD'S COMPLETE"

INTERCHANGEABLE

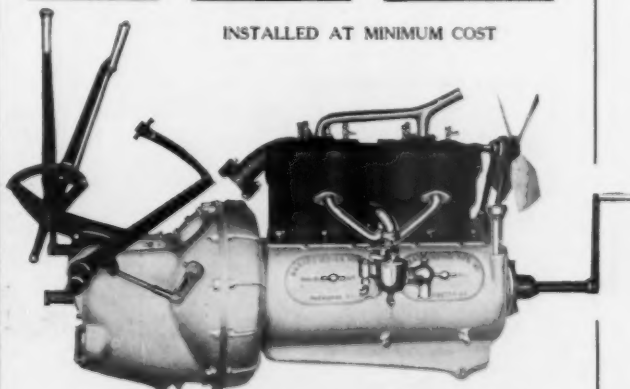
STRICTLY THREE-POINT SUPPORT

### UNIT POWER PLANT

—FOR—

MOTOR BUSINESS VEHICLES

INSTALLED AT MINIMUM COST



NOTE—Gear shift lever and emergency brake mounted on transmission. Arranged for either right or left-hand drive.

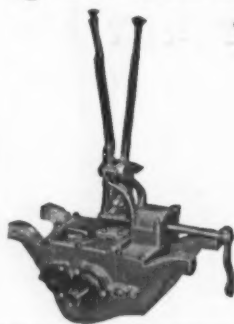
SALES ASSURED IF YOU ADOPT THE HAZARD

REASONS—Oil-tight and dirt-proof—simple—surprisingly powerful—compact—quiet—balanced—strong—"get-at-able."

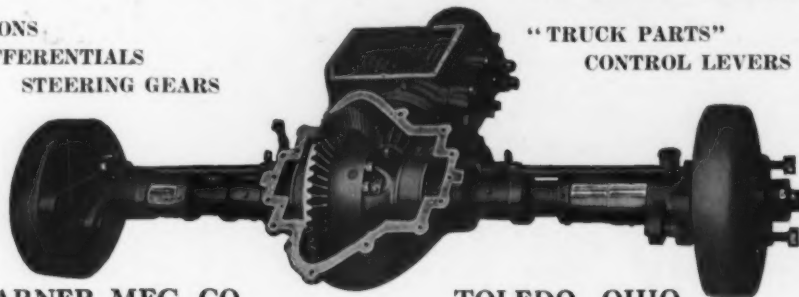
**HAZARD MOTOR MFG. CO.**  
89 SCHERER ST. :: ROCHESTER, N. Y.



## QUALITY—UNIT POWER PLANT—MOTORS



TRANSMISSIONS  
DIFFERENTIALS  
STEERING GEARS



"TRUCK PARTS"  
CONTROL LEVERS

THE WARNER MFG. CO.

TOLEDO, OHIO

## WORM DRIVE?

YOU WILL BE INTERESTED IN OUR FULL PAGE ANNOUNCEMENT CONCERNING THIS TYPE OF DRIVE IN THE MARCH ISSUE OF THE "CYCLE AND AUTOMOBILE TRADE JOURNAL," PAGE 343.

DON'T FAIL TO READ IT.

**BROWN & SHARPE MFG. COMPANY, Providence, R. I., U. S. A.**

Steel Frames  
Radiators  
Hoods  
Fenders  
Tanks  
Oilers  
Mufflers  
Under Pans

**W**E make a wider range of parts for Commercial Vehicles than any manufacturer in the world. Send for Catalogue No. 233.

**The Kinsey Mfg. Company**  
Toledo, Ohio

Brake Drums  
Step Brackets  
Battery Boxes  
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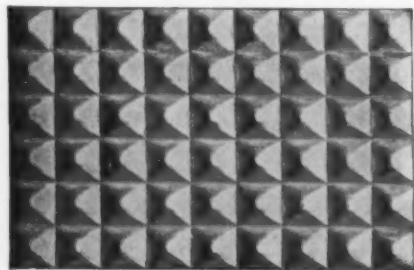
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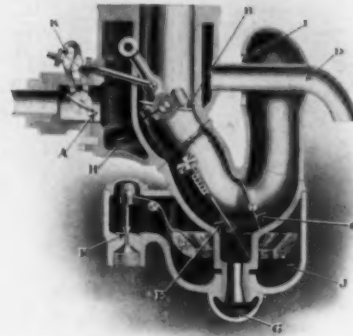
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